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DRAFT

NORTH WATERFRONT PARK
LAND USE PLAN
ENVIRONMENTAL IMPACT REPORT

APRIL 1, 1978



SPECTRUM NORTHWEST

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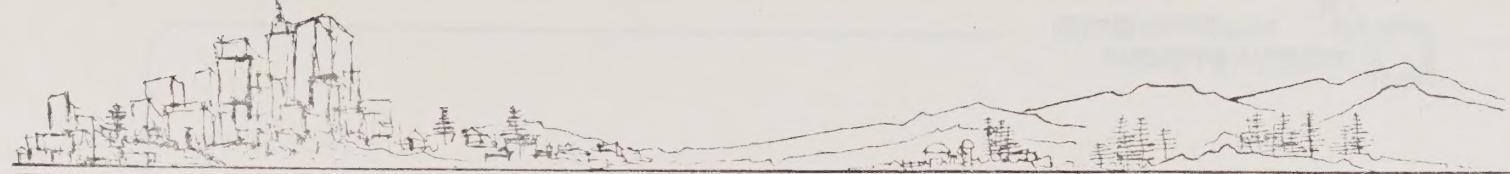
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April 11, 1978

City of Berkeley
Waterfront Advisory Board
201 University Avenue
Berkeley, Ca. 94710

Chairman Bennett and Members of the Board:

It is with a profound sense of satisfaction that we present you with our Environmental Impact Report for the North Waterfront Park Land Use Plan.

This document, which represents many hours of investigation, planning, and analysis has been substantially enriched by the comments, suggestions, and observances of members of the Board over the past two years.

In our judgment, this document meets state and local requirements for a land use plan. It has been reviewed, and commented on, by members of the city's staff. Most of their suggestions have been incorporated into this product.

In its final public version, this document will be combined with the North Waterfront Land Use Plan and bound as a single volume. It is our intention to standardize the graphics in the final version; therefore minor text revisions may become necessary. As a result, the opportunity to comment on the document is still available and is hereby extended to the Board.

Sincerely,

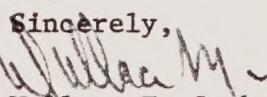

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SUMMARY

The City of Berkeley currently operates a Class II-2 sanitary landfill disposal site on approximately 90 acres of diked San Francisco Bay tidelands situated north of the Berkeley Marina between the westerly extensions of Page and Gilman Streets.

The site, which receives approximately 390 tons of unclassified municipal refuse daily, is nearing capacity and it is intended that the resulting lands be developed into an unstructured recreational area complete with an urban wildlife sanctuary. As a consequence, a Land Use Plan, designed to guide the development of the proposed facility, has been prepared.

Under California law, a public agency, such as the City, is compelled to examine actions it proposes for consistency with the goals outlined by the Legislature in the California Environmental Quality Act (CEQA). This report is designed to fulfill that requirement.

The proposed action (development of a public unstructured recreational facility on the current landfill disposal site) would have certain adverse environmental effects; most of which are construction related. Mitigation measures have been proposed, to reduce these potential impacts, to levels of general community acceptability.

Alternatives to the proposed project have also been analyzed in terms of ability to meet project objectives and potential environmental effects.

The Land Use Plan, together with the environmental impact report (EIR), will be presented to the City's Planning Commission and City Council for approval and adoption. Public hearings will be held (at a time and place to be later announced) to receive written and oral comments from members of the public-at-large, interested groups, and public agencies.

CHAPTER I

BACKGROUND

In 1913, the City of Berkeley, by grant of the California Legislature, acquired title to the public tidelands along the City's western shore, and initiated a series of dike and fill operations to dispose of its municipal solid waste, and to create lands for future development.

Berkeley's action was by no means unique. Filling actions were commonplace among municipalities enjoying bay exposure and was occurring at a pace that was disturbing to many environmentalists who feared that the delicate (and unique) eco-system of the Bay's inter-tidal zone would be destroyed. Largely as a result of the persuasive actions of concerned individuals and groups, the Legislature passed the McAteer-Petris Act which created the Bay Conservation and Development Commission (BCDC) in 1965. The Commission was given the responsibility for preparing a comprehensive plan for the future development and use of San Francisco Bay and for regulating fill, dredging, and development activities in the Bay and the shoreline band extending 100 yards inland from the mean higher high water mark.

Prior to the passage of McAteer-Petris, Berkeley was disposing of its municipal solid waste in a dike and fill operation north of Spinnaker Way. This activity was deemed exempt from the provisions of the BCDC Bay Plan under "Grandfather" provisions of the amend-

ments to the original Act. In 1967, the Berkeley City Council decided to complete the fill operation between the north dike and Spinnaker Way. The City then undertook the preparation of a series of preliminary plans for the use of the lands expected to result from completion of fill activities.

In 1973, the United States Army Corps of Engineers, under authorization of the Rivers and Harbors Act of 1889 and Public Law 92-500, informed Berkeley that continuance of filling activities, at elevations lower than mean lower low water, would require a Corps permit. The City, although disputing the Corps' jurisdictional claim, submitted an application for a permit which the Corps took under advisement until June, 1974. During this period, filling activities continued; however, the Council (by Resolution 45,688 N.S.) created the Waterfront Advisory Board for the purpose of recommending, to the Council, policies for the development and use of Berkeley's waterfront areas including the active fill area north of Spinnaker Way.

In 1974, the Corps requested additional information for consideration of Berkeley's permit application. The requested information was supplied, by the City, in July, 1975. Three months later, the Corps secured a Preliminary Federal injunction, which prohibited the City from future landfill operations on the disposal site in the 18 acres just south of the north dike, until the Corps permit process had been completed.

Pursuant to provisions of Public Law 91-190, the National Environmental Protection Act (NEPA), Federal agencies with permit or license



issuance authority must evaluate the potential consequences of their actions for consistency with the goals of national environmental quality as established by the Congress. The preliminary determination of the Corps, based upon information submitted by the City, was that the continuation of fill operations, which would occur if a permit were issued, could adversely effect the environment and therefore required the preparation of an Environmental Impact Statement (EIS). The Corps informed the City of Berkeley, and the general public, in Public Notice Number 9434-47 of its intention to prepare (or cause to be prepared) an EIS prior to acting upon the City's permit application. This notice also solicited comments from the public and affected public agencies.

As a result of the public notice, several comments were received by the Corps and forwarded to the City for response. These comments can be divided into two categories; those of Federal and State agencies, and those from members of the public-at-large. The majority of agency responses indicated a desire to reserve formal comment until afforded an opportunity to review a draft EIS. The comments received from members of the public-at-large were, in the main, from environmentally concerned organizations which questioned the future use of the land resulting from completion of the fill operations.

Conservative estimates, by both Corps' staff and environmental consultants to the City, were that the completion of the data gathering, report preparation, and public review tasks associated with a formal EIS for the permit would require approximately 12 months; and, at the rate of refuse intake to the landfill operation, that portion

of the site outside of the Corps jurisdictional claim would be overcome in late 1976. Had this occurred, the City would have been left with but two options; 1) discontinuance of disposal operations, and 2) stacking incoming refuse in the unaffected area until completion of the environmental review processes.

Further complicating the situation, the City received an order from the San Francisco Bay Regional Water Quality Control Board (RWQCB) to cease the practice of discharging waters impounded south of the northerly dike (from an area approximately seven acres in size) to San Francisco Bay, and to prevent contact of Bay waters with the waste material portions of the fill (which was occurring due to leaks in the peripheral dikes). These requirements dictated that repairs to the northern dike and construction of an interim pumping facility be undertaken in an area that was also within the Corps jurisdictional claim. This too would have required a Corps permit.

In an effort to chart a course of resolution out of the maze of agency and public goals (which were to some extent in conflict), Berkeley's Director of Public Works and members of the City staff, met, on February 17, 1976, with members of the Golden Gate Chapter of the Audubon Society and the Sierra Club. As a result of these meetings, a preliminary layout of the proposed Northern Waterfront Park was prepared, by City staff, which incorporated pertinent design features favored by these groups. Additionally, the Director pledged to urge the City Council to expeditiously pass recommended amendments to the Open Space Element of the City's Master Plan which committed the City to the use of the study area lands for "unstruc-

tured recreational" purposes to the greatest extent possible.

These actions satisfactorily mollified the concerns of the two groups; and as a consequence, they withdrew their objections to issuance of a Corps permit.

Additionally, several meetings (and numerous telephone conversations) were held with officials and staff of various public agencies by: personnel of Berkeley's Department of Public Works and City Attorney's Office, engineering consultants to the City from the firm of Harding-Lawson Associates, and environmental consultants from the firm of Spectrum Northwest. These exchanges culminated in a joint meeting, held May 6, 1976 in the City of Berkeley, which was attended by representatives of all agencies and groups known to be interested in or affected by completion of the proposed fill activites and development of the resulting lands.

At this time, the Director of Public Works presented a proposed Action Plan, which had been distributed prior to the meeting, for comment and recommendation of those present. Several minor modifications to the plan were discussed and the plan was endorsed for subsequent presentation to Berkeley's City Council.

The Action Plan set in motion a series of activities which resulted in the Draft North Waterfront Land Use Plan (the proposed project) that calls for the development of a public unstructured recreational facility (to the greatest extent possible) on the site of the existing Berkeley landfill operation.

Based upon the apparent acceptance of the Action Plan, and the pre-

paration of an environmental assessment for the Corps by Spectrum Northwest [An Investigation of the Environmental, Economic, and Social Aspects of the Berkeley Refuse Disposal Landfill; Spectrum Northwest, June, 1976] the Corps dropped their requirement for a full EIS and issued Berkeley a permit to complete fill operations in March of 1977.

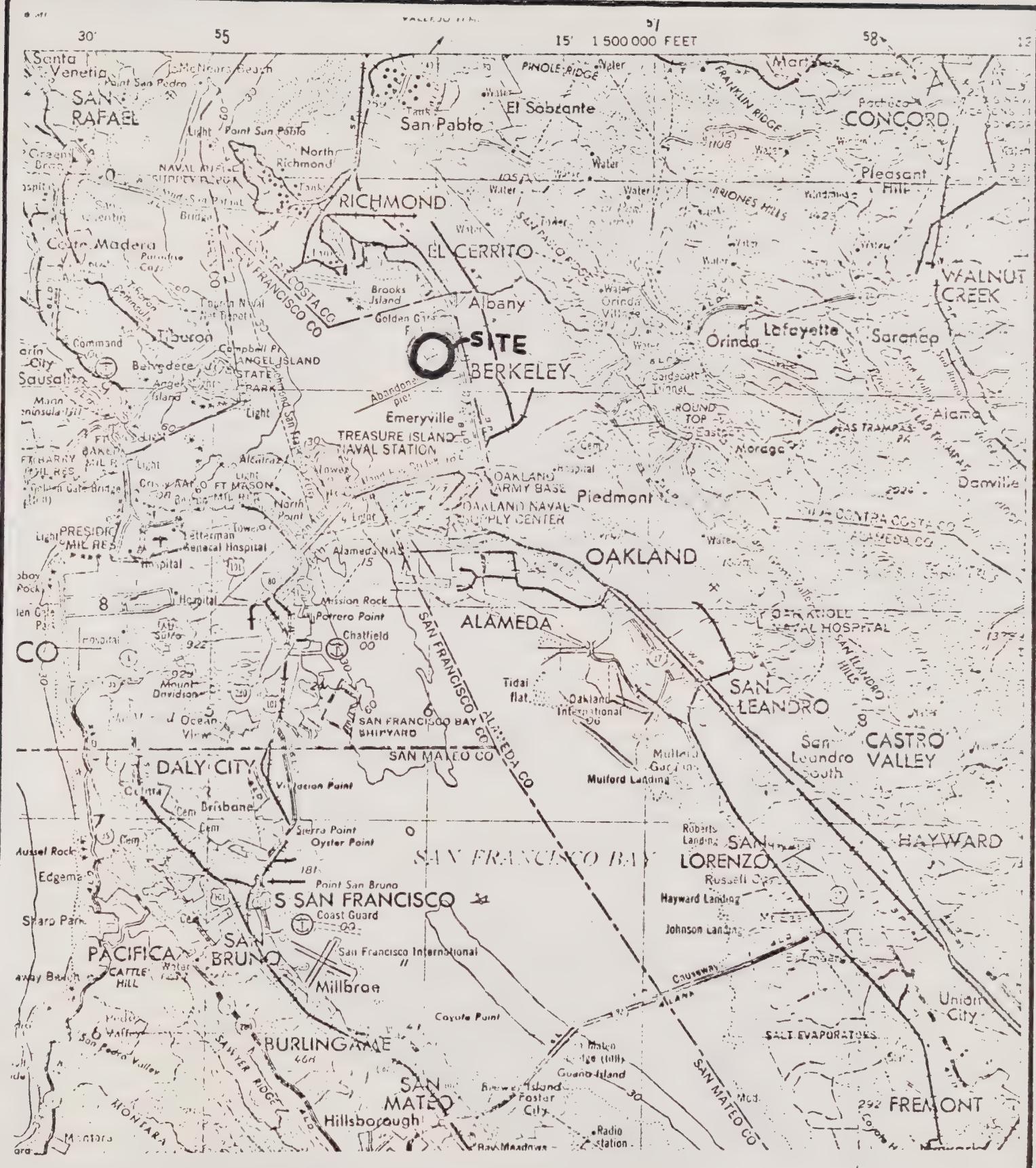


FIGURE 1
REGIONAL MAP

LOCATION MAP

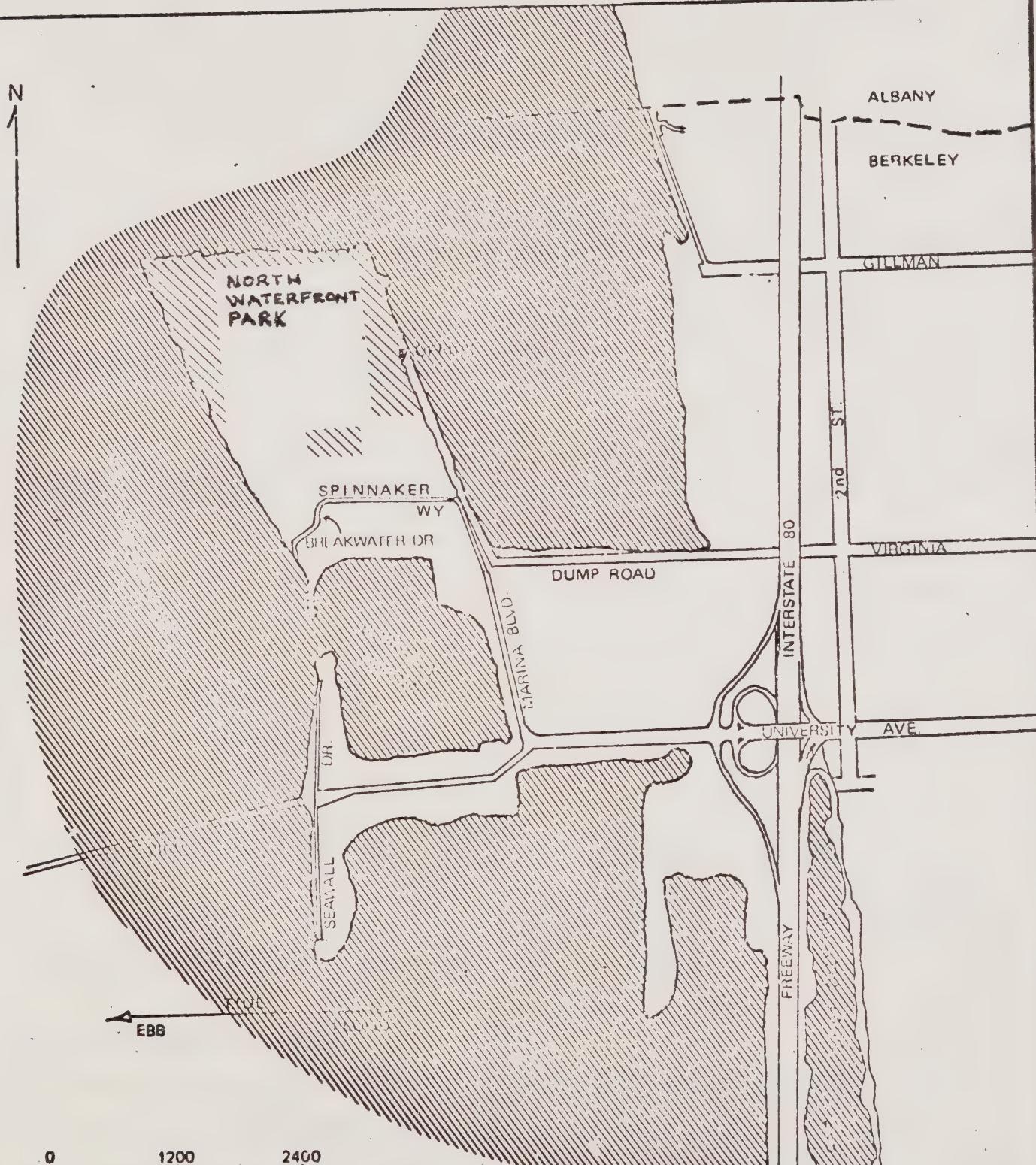


FIGURE 2

CHAPTER II

PROJECT DESCRIPTION

The proposed project is a land use plan for the publicly-owned lands north of Spinnaker Way. The location and physical characteristics, of the approximately 90 acres which are involved, are described in Chapter III - Environmental Setting.

The proposed land use is described in detail by the document Berkeley North Waterfront Park Draft Land Use Plan [City of Berkeley, Department of Recreation, Parks, and Community Services, October, 1977] which is hereby incorporated by reference. This plan envisions the division of the study area lands into three zones which are:

- Recreation Zone
- Transition Zone
- Natural Zone

Figure 3 displays the approximate boundaries of the three zones, while the following narrative describes proposed use levels and pertinent features of each zone.

Recreation Zone

The Recreation Zone would commence at the park's entrance, which would be located at the southern end of the study area, and is approximately 40 acres in size. As its designation implies, this zone is expected to support the most intense recreational use planned for the park. The zone would feature general purpose play areas which would consist of unmarked meadows of irrigated, turf grass

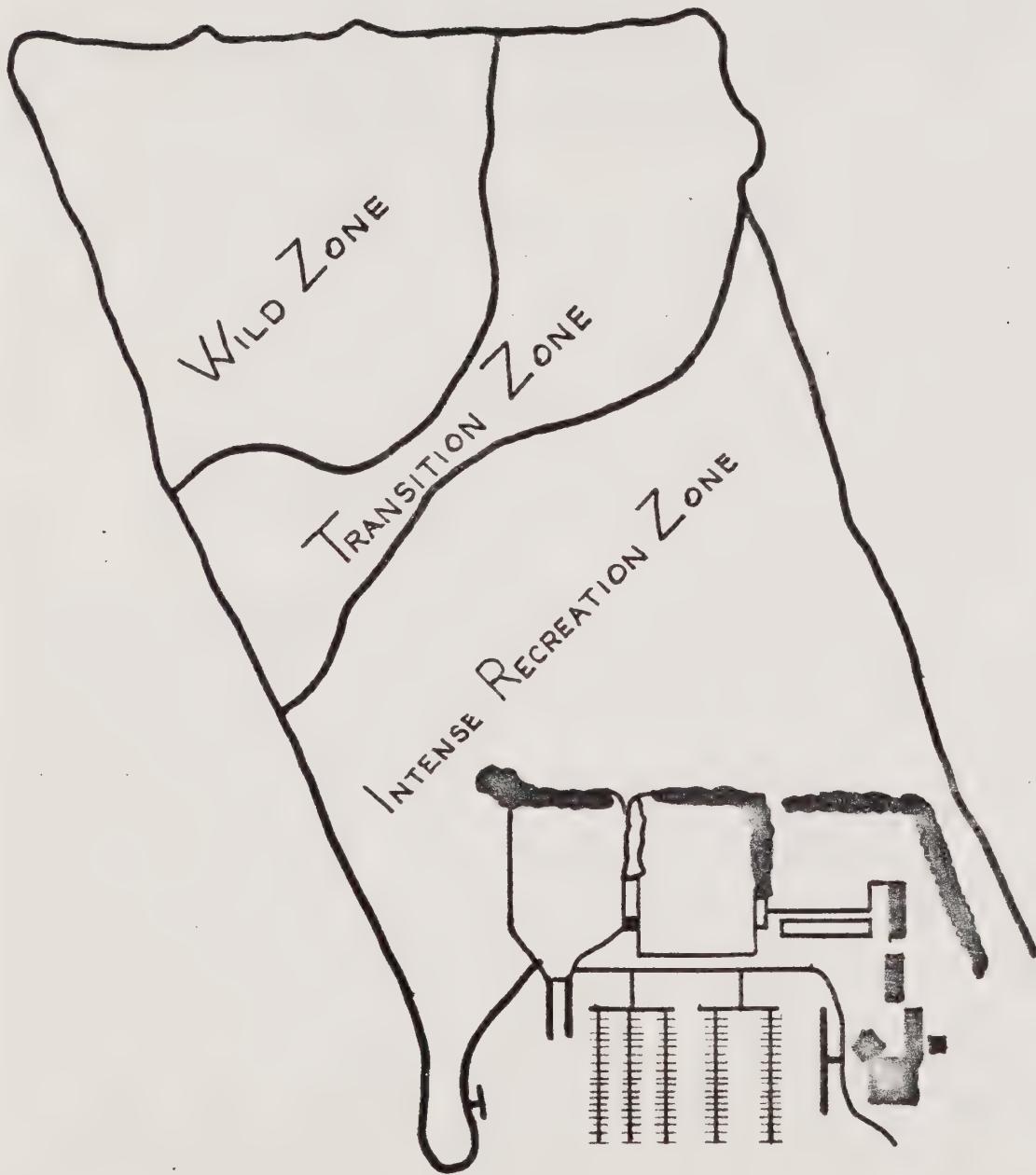


FIGURE 3
ZONE BOUNDARIES



large enough to accomodate simultaneous softball, football, and soccer games. The Recreation Zone would also include:

- a park headquarters and maintenance building
- earth mounds for wind protection
- a tot play area
- a day camp and overnight camp area
- vista points
- shoreline fishing areas
- plant growing grounds
- paved paths (for bicyclists, joggers, and handicapped persons)

Transition Zone

The Transition Zone would be situated immediately north of the Recreation Zone and is intended to serve as a buffer between the more intense activity planned for the Recreation Zone and the Natural Zone. This zone which would be approximately 20 acres in size, is expected to sustain the second-highest level of human activity within the park, and is designed to support such individual recreational activities as: walking, jogging, wildlife observation, scenic appreciation, meditation, etc. The physical features of the zone would include:

- earth mounds for wind protection
- vista points
- shoreline fishing areas
- natural (unirrigated and unmowed) meadows or grasslands
- diverse plant communities
- paths (similar to those in the Recreation Zone)



- a wildlife overlook area (with paved access for handicapped persons)

Natural Zone

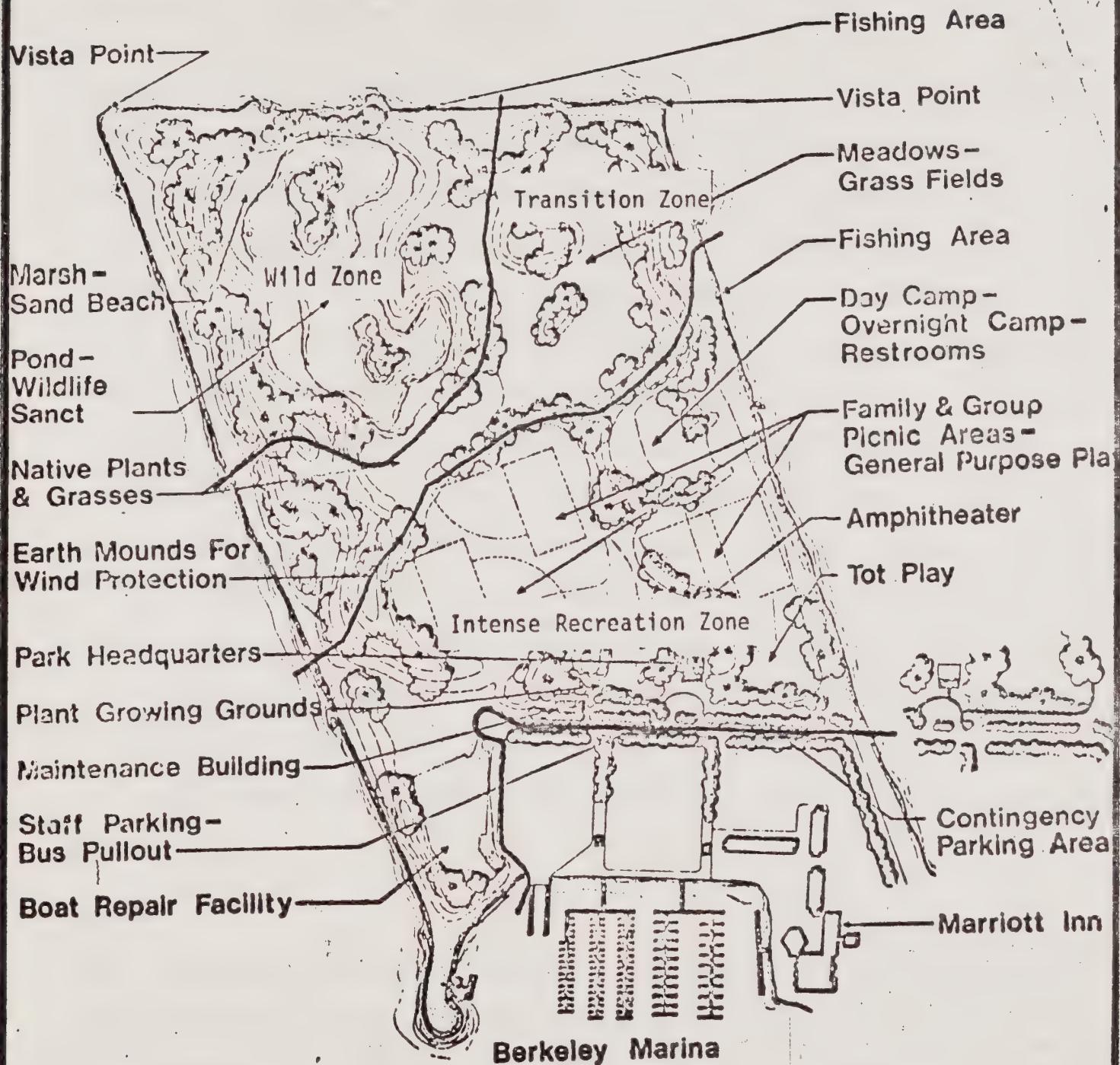
The Natural Zone is intended to function as a wildlife sanctuary and is therefore designed to restrict human activity to areas least likely to disturb wildlife. This zone would be approximately 30 acres in size and would feature:

- a seven (7) acre fresh water pond and wildlife sanctuary
- bird attracting plant communities
- earth mounds for wind protection
- vista points
- a wildlife overlook
- unpaved pedestrian/jogger paths
- shoreline fishing areas

In addition to the features of the three zones discussed above, the proposed park would include: a small parking area, a mass transit and handicapped on-loading/off-loading area, and a service/maintenance road. Further, consideration is currently being given to installation of an irrigation system, and a sub-surface drainage system. Figure 4 displays the prominent features of the park's three zones and their relationship to each other.

Construction Schedule

The construction of the proposed facilities would take place over the next several years commencing with the facilities of the Recreational Zone. During the first few years of construction, landfill operation would continue in the northern portion of the park until



**FIGURE
PARK
FEATURES**



that area is brought to pre-determined elevations.

Construction of individual zones would be divided into activity phases. The initial activity would include construction of the wind protection mounds and placement of soil materials (final cover) to specified depths adequate to support the various plant materials planned for the area. After allowing sufficient time for initial settlements to take place and compensating for differential settlements (see discussion of Natural Subsidence, Chapter III - Environmental Setting) work could begin on sub-surface facilities (i.e. sanitary wastewater removal system, methane monitoring system if required, drainage facilities, power and irrigation systems) deemed to be necessary. Then, construction could commence on surface facilities such as: the park maintenance and headquarters building; parking lot and public transportation depot; maintenance road; and pedestrian, bicycle, and jogging paths. Finally, the placement of plant materials, ground cover, and other assorted surface objects would occur.

Costs

The preliminary estimated construction cost of the proposed project ranges from \$7,000,000 to \$10, 000,000 (1977 dollars). Funds for the initial design and planning activities of the park would be derived from the City's Waterfront and Marina Development Fund. Maximum efforts would be made to secure construction funds from non-local sources such as: Federal Housing and Community Development Block Grants, Urban Action Grants, Public Works Bill Grants, HEW Grants, State Land and Water Conservation Fund matching grants, and Fish and Wildlife Grants.



The annual operating/maintenance costs associated with the proposed project are anticipated to be approximately \$100,000 (1977 dollars) and would most likely be derived from Waterfront and Marina Development Fund sources. No plans to charge admission to the park are contemplated at this time.

CHAPTER III

ENVIRONMENTAL SETTING

In keeping with recent amendments to the California Environmental Quality Act, the discussion within this section will be limited to summaries of those factors of the existing physical environment which are likely to be affected by (or affect) the proposed project. For a detailed discussion of the physical environment of Berkeley, the reader is referred to the Berkeley Environmental Inventory and various elements of the Berkeley General Plan [Berkeley Department of Comprehensive Planning] from which much of the presented information is extracted and which by reference is herein incorporated.

LOCATION

The proposed project's study area is the existing Berkeley Sanitary Landfill Disposal Site and is composed of approximately 90 acres of former San Francisco Bay tidelands and mudflats that protrude into San Francisco Bay from the north-central Berkeley shoreline. Figure 1 displays the site's relationship to the San Francisco Bay Region.

The site is protected on three sides from tidal action of San Francisco Bay by man-made dikes which are composed chiefly of: concrete rubble, demolition debris, impervious soil materials, and strategically placed armour rock. Figure 2 is a location map of the study area.

Situated to the south of the proposed project's study area is Spinnaker Way, the Berkeley Marina complex, and a municipal fishing pier. To the southeast of the study area are the lands of Murphy and Santa Fe.

The study area is separated from the Berkeley shoreline on its eastern side by the North Sailing Basin and is presently accessible by only one land route - Dump Road. The business and residential areas of the City are separated from the project area by the North Sailing Basin and the elevated roadway of Interstate I-80.

TOPOGRAPHY

The topography of the study area is generally flat and few dominant topographical features exist. The on-going fill and cover operations slightly modify the sites topographical character continuously.

The dikes surrounding the study area range in elevation from approximately 8 feet mean sea level (MSL*) on the eastern (or shoreward) side to approximately 13 feet MSL along the western (or bayward) exposure. Figure 5 is a map which details the topographical characteristics of the study area.

GEOLOGY

The study area lies on a sedimentary plain situated between San Francisco Bay and the foothills of the California Coastal Mountains. Rocks of the Franciscan group are thought to comprise the bedrock underlying the alluvium, bay mud, and waters of San Francisco Bay west of the Berkeley shoreline. However, no borings to bedrock are known to have been made in the immediate vicinity of the study area.

Recent bay mud overlies the deposits of the Temescal Formation and Merrit Sand along the shore of the Bay, or, where these formations have been removed by erosion, rests directly on the Alameda Formation. [Areal and Engineering Geology of the Oakland West Quadrangle; USGS Miscellaneous Map Series 1-239, 1957]

The bay mud forms extensive tidal flats along the edge of the shore and underlies the man-made garbage fill of which the study area is chiefly composed. With the exception of the colluvium and the artificial fill, recent deposits are confined largely to bay mud in the areas now under water adjacent to the study area. The small amount of recent alluvium deposited by streams, flowing from the Berkeley hills, has been so disturbed by construction and dredging activities that it is difficult to separate it from the Temescal Formation deposits.

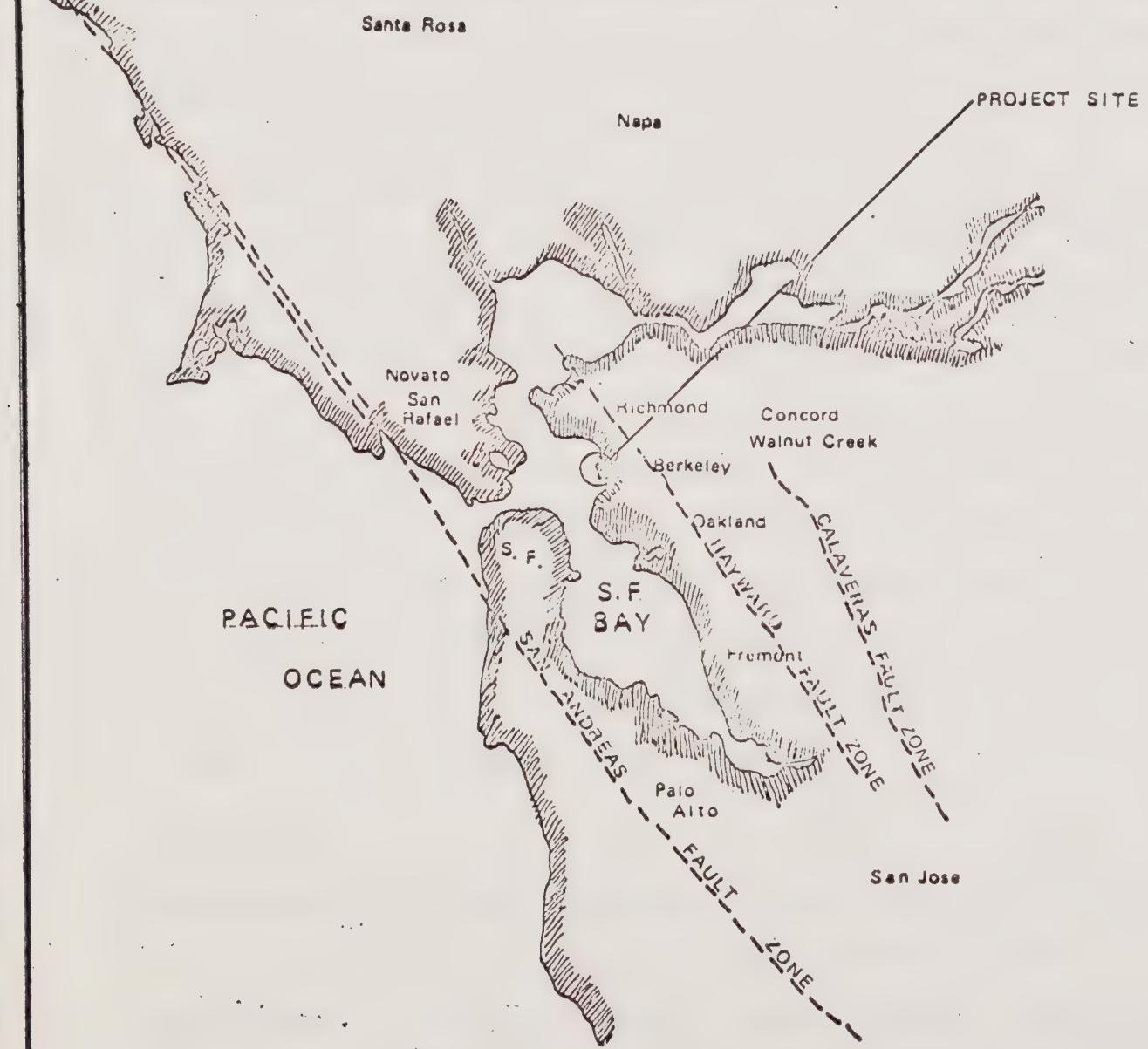
There is some evidence to suggest that the study area overlies an alluvial fan which is part of an aquifer extending from under the bay, eastward, to the foot of the Berkeley hills. [Geologic Map of California - San Francisco Sheet; State of California Department of Natural Resources, Division of Mines, 1976]

SEISMIC ACTIVITY

The study area is situated approximately 16 miles from the San Andreas Fault and 3.0 miles from the Hayward Fault. Further to the east, approximately 11 miles, is an extension of the Calaveras Fault (see Figure 6).

All the faults within the San Francisco Bay Region are part of what is broadly termed the San Andreas Fault System. These faults trend

ACTIVE FAULTS IN SAN FRANCISCO BAY



SPECTRUM NORTHWEST 1976

FIGURE 6



northeastwardly and display similar directions of movement. This movement is known as "right-lateral-shift" and results in the movement of the rock mass on the southwest side of each fault northwest-erly in respect to the rock mass of the northeastern side of the rift zone. [Studies for Seismic Zonation of the San Francisco Bay Region, Geologic Survey Professional Paper 941-A; U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 1975]

Fault displacements can occur suddenly, such as during an earthquake, or as the result of very slow (or tectonic) movement. Both types of movement have historically occurred along faults of the San Andreas System. Tectonic creep along faults that are well lubricated, or faced with plastic materials, are often undetectable to the untrained observer. However, along rift zones that are poorly lubricated, or faced with brittle materials, the plates (or opposing sides of the rift zone) often seize. Then, when forces build up over time to a point which exceeds the capacity of the rift zone materials, the rock shears and the sudden release of energy results in ground movement known commonly as an earthquake.

SEISMICITY

A strong seismic event (earthquake) along any of the active faults of the San Andreas System could induce secondary effects such as: liquefaction or subsidence within the study area. Additionally, the site is subject to tsunami inundation according to the Seismic Safety/Safety Element of the Berkeley Master Plan. This plan, which identifies the entire Berkeley waterfront area as being subject to tsunami inundation, is based upon an assumed risk factor of 1



in 4 that a 20 foot high tsunami wave will occur at the entrance to the Golden Gate once every 200 years and result in a wave approximately 10 feet high along the Berkeley shoreline. This height, however, is the crest to trough distance so that the actual wave height would only be five feet above the astronomical tide level at the time. These estimates differ somewhat from those suggested by a study, conducted by the United States Army Corps of Engineers. [Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound, Technical Reports H-75-17; U.S. Army Hydraulics Laboratory, 1975]. This report suggests that the maximum run-up (i.e. the combined height of tsunami wave and simultaneous astronomical tide) at the study area would be 6.3 feet once in 100 years and 11.4 feet once in 500 years.

Inasmuch as the height of the dikes surrounding the study area range from 11 feet to 13 feet above MSL, there is a slight possibility that the study area could be adversely affected by tsunami.

NATURAL SUBLIMATION

The material composing the study area consists of a variety of organic, metallic, and inert substances. Over time, the organic and metallic constituents will undergo decomposition, as the result of several complex chemical and microbiological processes, and lose a portion of their mass. This will cause the overlying cover material to subside. Such subsidence, or settlement will most likely be: differential, occur mainly in the first decade following closure of the landfill, and will depend on compaction rates achieved throughout the landfill over the years. Estimates of 10' of settlement within the first two decades following cessation of fill activities

have been made. [Wm. Dabel, Assistant Director Berkeley Department of Public Works, Personal Conversation, March, 1977]

FLOODPLAIN

The Berkeley Master Plan's Seismic Safety/Safety Element identifies the study area as being subject to inundation by the 100 year flood (one subject to occur but once in 100 years). Although the study area has no surface streams or creeks, areas which are usually associated with flooding, planners estimate that, in the event of the 100 year flood, the City's storm drainage system would most likely be overcome and the street system would convey flood waters to the waterfront area, which is the direction of the City's natural drainage due to its topographical character.

CLIMATE

The study area is situated in one of the mildest climatic regions in North America in which few of the climatic factors ever reach extremes. The climate is classified as Summer Mediterranean Dry and is characterized by warm, dry, summers; mild, wet, winters; and frequent fog. The highest recorded temperature is 106°F while the lowest is 25°F. The temperature exceeds 90°F an average of only three days in a normal year while it is below freezing but one day per year.

The average annual rainfall observed in the Berkeley area is 23.5 inches, 84.0% of which occurs during the period November through March. Intensities seldom exceed 0.5 inches per hour or 2.5 inches during a 24 hour period. The greatest recorded rainfall in one hour was 0.88 inches observed in April, 1958. Annually, precipita-



tion in excess of 0.5 inches, within a 24 hour period, occurs approximately 16 times. Rainfall within the study area is generally lower than that observed at the higher elevations of the City.

Hail occurs rarely and has not been noted of damaging intensity. A trace of snow is observed approximately once every five years.

One of the most significant climatic factors along the Berkeley waterfront is the wind. Situated directly east of the entrance to San Francisco Bay, the study area is subject to brisk marine breezes much of the time. The average air movement is 7.2 miles per hour, generally from the south, southwest, and west. Figure 7 is an annual wind chart which graphically presents the seasonal direction and intensity of prevailing wind patterns in Berkeley.

The marine origin of the prevailing winds insure that they will generally be of low temperature and high humidity. These characteristics often make the wind raw and uncomfortable. However, during sunny, windless days (which are few) the area is quite warm.
[Berkeley Environmental Resources Inventory, Section IV-B; Berkeley Department of Comprehensive Planning]

AIR QUALITY

The ambient air quality at the disposal site is good. Situated immediately east of the Golden Gate, the site is subject to brisk marine breezes almost constantly. However, the operation of the landfill does have an adverse effect on local ambient air quality. The release of dust during cover operations, smoke from occasional fires (a rare occurrence), and odors from exposed garbage all combine to degrade the local airshed.

Operational mitigation measures are employed to keep these adverse impacts at a minimum. The measures include the use of water for dust control and fire suppression, and prompt cover of garbage material with soil cover.

NOISE

The active dump portions of the study site are very noisy during most of the operational hours. The primary sources of elevated ambient noise levels are: the diesel operated tractor, which is used to spread and cover the waste material; the compactor; and the many collection trucks discharging their collected wastes. Additionally, several hundred assorted privately-owned vehicles operate in the active dump area daily.

The inactive portions of the site to the south are surprisingly quiet. Along the west side, away from the active fill area, the predominate sounds detected are: the waters of the bay lapping against the dike; the calls of various birds; and occassionally, aircraft operating from Oakland Airport or Alameda Naval Air Station. During periods of slack winds, the noise of traffic along Interstate I-80 can also be detected.

Measurements of site specific ambient noise levels were not undertaken for this report; however, a study, undertaken by the City for the purpose of preparing the Noise Element of the Berkeley Master Plan in 1975 indicates a day-night average (Ldn) sound value of 70 at Gilman Street between Curtis Street and Nielson Street, a location east of the Interstate I-80 strip (see Figure 8).

ANNUAL WIND VELOCITY

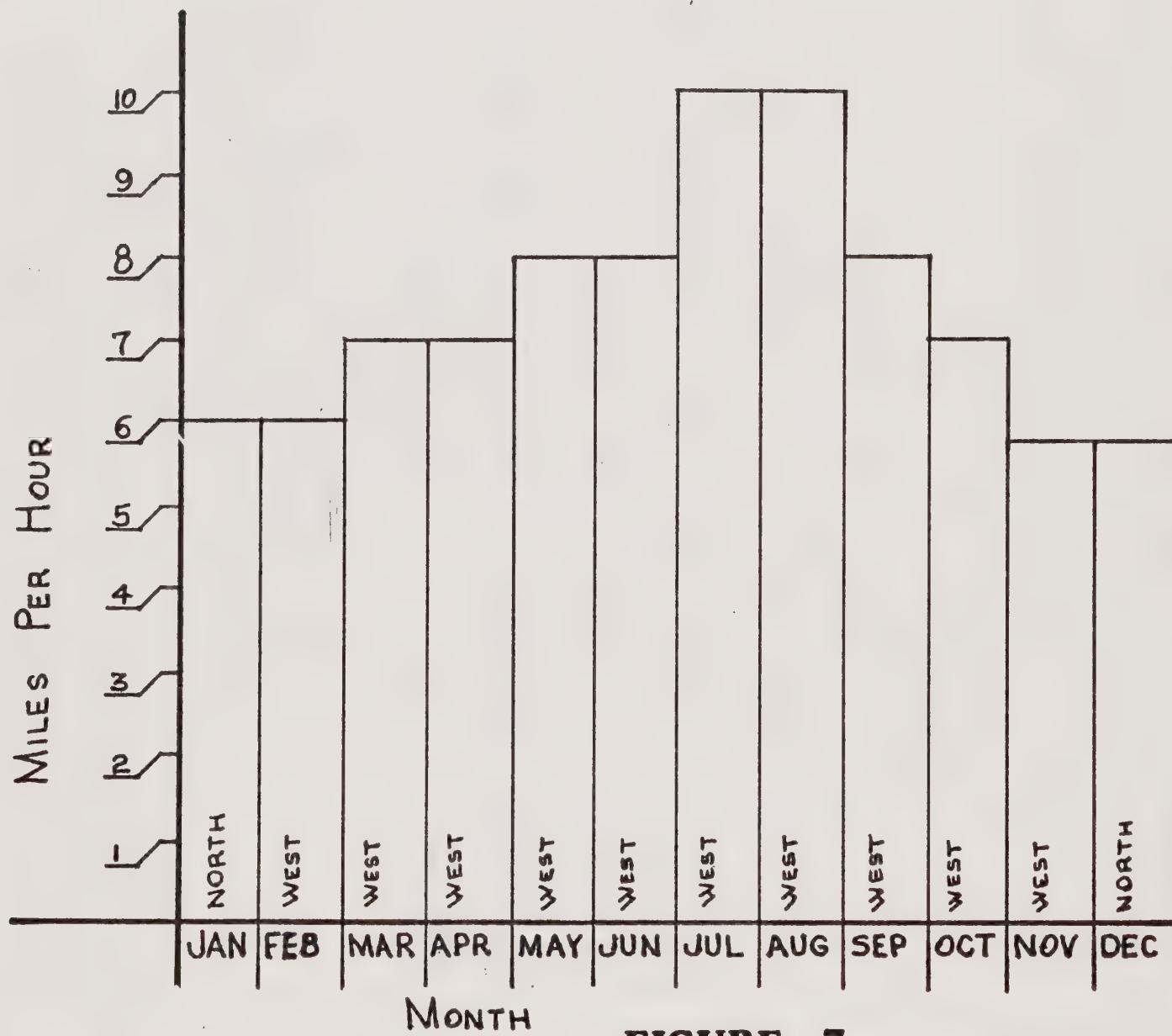
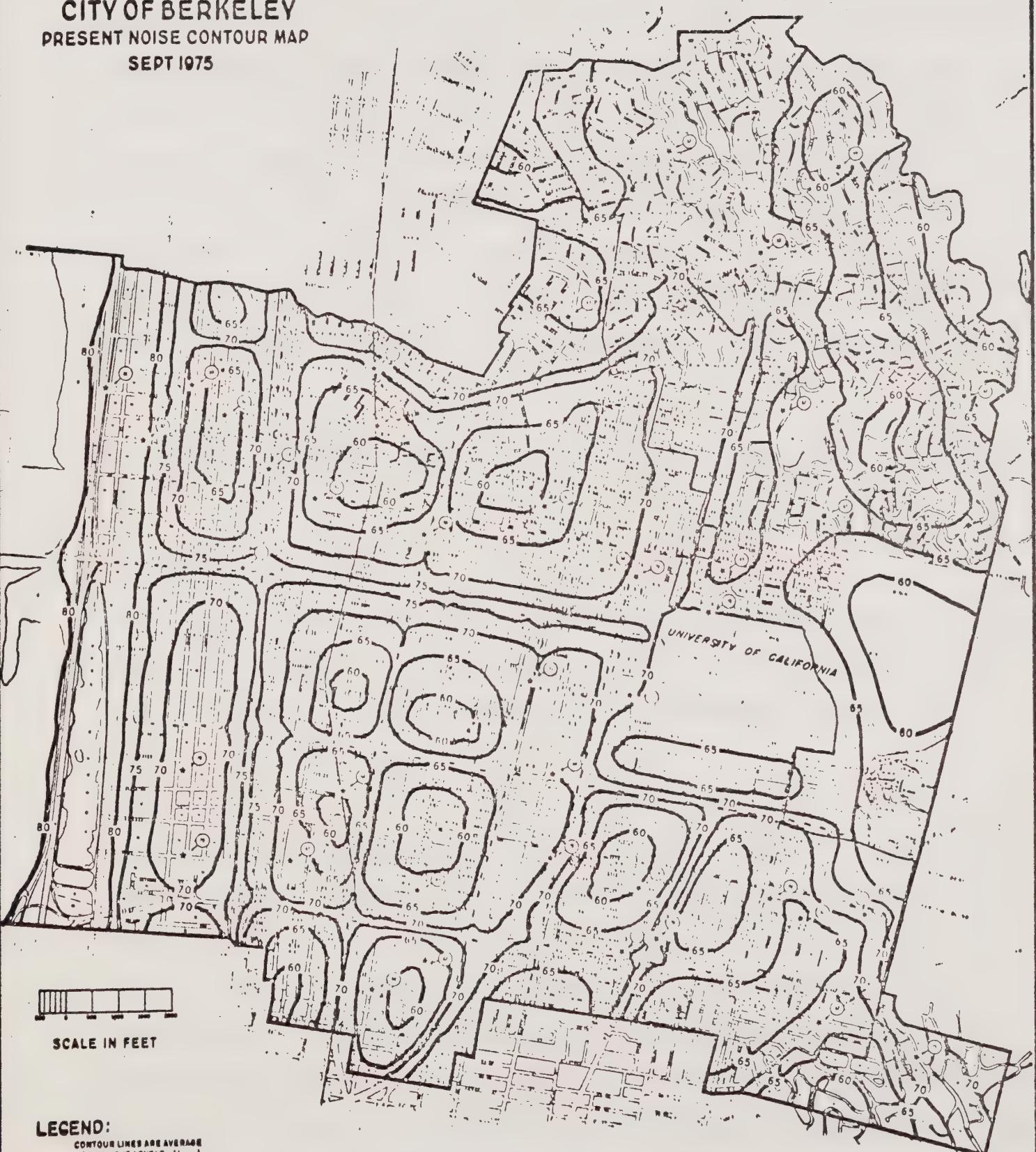


FIGURE 7

CITY OF BERKELEY
PRESENT NOISE CONTOUR MAP
SEPT 1975



TERRESTRIAL PLANT LIFE

None of the study site has received final cover as required by the RWQCB; however, that portion which has received some soil cover material, is sparsely inhabited by a few hardy species of weeds, grasses, sedges, and shrubs. These species were introduced within the top soils used to cover the compacted solid wastes, as wind blown seeds from other Bay Area systems, by birds visiting the site, and by clippings from various yards and gardens. No single area can be considered a natural community complex of vegetative types.

No rare or endangered plant species are known to exist on the study site.

TERRESTRIAL ANIMAL LIFE

Although the study area's original natural saltwater marsh (or tidal mud-flat) habitat has been severely modified by the landfill operation, some of the more tolerant of the indigenous species have survived and are present today.

(Mammals)

Presently the study area is known to harbor several species of terrestrial mammals which include: Rats (Rattus norvegicus), House mice (Mus Musculus), Pocket gophers (Thomomys bottac), California Moles (Microtus californicus), Black-tailed jack rabbits (Lepus californicus), and ferel House cats (Felis domesticus).

Additionally, the area may harbor: Roof rats (Rattus rattus alexandrinus), Salt marsh harvest mice (Rethrodontomys megalotus), Ornate shrews (Sorex ornatus), and one or more species of the genus mouse. Bats of several species have also been observed in the study area

during the early evening hours.

(Birds)

By far the most numerous and diverse species of wildlife present in (and near) the study area are birds. Some 45 species of terrestrial and aquatic birds are commonly observed in the area and another 80 to 90 species are occasionally sighted in the vicinity of the area (see Table 1).

Both the mammal and bird populations are heavily dependent upon the easy availability of food and reasonably safe nesting places provided by the current landfill operation. The micro-ecosystem (within the study area) can be regarded as being dominated by rodents and scavengers which in turn support limited populations of predators.

(Amphibians)

The Pacific tree frog has been sighted near the study area; however, no sightings in the study area proper are known to have been made.

(Rare and Endangered Species)

The Endangered Species Act of 1970 (California Legislature) requires the State's Department of Fish and Game to establish criteria for determining if a species or sub-species of bird, mammal, fish, amphibian, or reptile is "endangered" or "rare". Under the law, a species is "endangered" when its prospects of survival and reproduction are in immediate jeopardy from one or more causes including: loss of habitat, change of habitat, over-exploitation, predation, competition, or disease. A species is "rare" when it, although not presently threatened with extinction, is in such small numbers throughout its range that it may be endangered if its environment

TABLE 1
BERKELEY BIRD INVENTORY

Aquatic Species:

| <u>Commonly seen</u> | <u>Occasionally seen</u> | <u>Rarely seen</u> |
|---------------------------|--------------------------|------------------------------|
| Common Loon | Red-necked Grebe | Ashy Petrel |
| Arctic Loon | Pelagic Cormorant | White Pelican |
| Red-throated Loon | Black Brant | White-fronted Goose |
| Western Grebe | Shoveler | Canada Goose |
| Horned Grebe | Redhead | Cinnamon Teal |
| Eared Grebe | Great Blue Heron | Green-winged Teal |
| Pied-billed Grebe | Green Heron | Barrow's Goldeneye |
| Brown Pelican | Snowy Plover | Common Scoter (Black Scoter) |
| Double-crested Cormorant | Semipalmated Plover | Virginia Rail |
| Mallard | Long-billed curlew | Sora |
| Pintail | Spotted Sandpiper | Clapper Rail |
| Canvasback | Greater Yellowlegs | Black-necked Stilt |
| Greater Scaup | Knot | Black Tern |
| Lesser Scaup | Sanderling | Common Murre |
| Common Goldeneye | Glaucous-winged Gull | |
| Bufflehead | Heermann's Gull | |
| White-winged Scoter | | |
| Surf Scoter | | |
| Ruddy Duck | Burrowing Owls* | White-crowned Sparrow |
| Common Merganser | House Sparrow | House Finch |
| Red-breasted Merganser | Red-winged Blackbird | Brewer's Blackbird |
| Common Egret | Starling | Meadowlark |
| Snowy Egret | Horned Lark | Barn Swallow |
| Black-crowned Night Heron | Rock Dove | Morning Dove |
| American Coot | Short-eared Owls* | Barn Owls* |
| American Avocet | | |
| Black-bellied Plover | American Bittern | Red-tailed Hawk |
| Killdeer | Least Bittern** | Marsh Hawk |
| Marbled Godwit | Whistling Swan** | Red Phalarope** |
| Willet | Yellow-breasted Chat | Wilson's Phalarope |
| Ruddy Turnstone | Wilson's Plover** | Sparrow Hawk |
| Dunlin | Wilson's Snipe | Pheasant |
| Least Sandpiper | Old Squaw | Sandhill Crane |
| Western Sandpiper | Blue-winged Teal | Purple Gallinule** |
| Northern Phalarope | Anna's Hummingbird | American Oyster-catcher |
| Western Gull | Widgeon | Whimbrel |
| Herring Gull | Wood Duck | Dowitcher |
| California Gull | Turkey Vulture | Black Guillemot** |
| Ring-billed Gull | White-tailed Kite | Goldfinch |
| Mew Gull | Sharp-shinned Hawk | Belted Kingfisher |
| Bonaparte's Gull | Cooper's Hawk | Long-billed Marsh Wren |
| Forster's Tern | | |
| Caspian Tern | | |

LAND SPECIES SEEN IN MARINA AREA:

| | |
|----------------------|-----------------------|
| Burrowing Owls* | White-crowned Sparrow |
| House Sparrow | House Finch |
| Red-winged Blackbird | Brewer's Blackbird |
| Starling | Meadowlark |
| Horned Lark | Barn Swallow |
| Rock Dove | Morning Dove |
| Short-eared Owls* | Barn Owls* |

THE FOLLOWING SPECIES ARE LISTED IN A PUBLICATION BY THE BERKELEY MARINA:

| | |
|----------------------|-------------------------|
| American Bittern | Red-tailed Hawk |
| Least Bittern** | Marsh Hawk |
| Whistling Swan** | Red Phalarope** |
| Yellow-breasted Chat | Wilson's Phalarope |
| Wilson's Plover** | Sparrow Hawk |
| Wilson's Snipe | Pheasant |
| Old Squaw | Sandhill Crane |
| Blue-winged Teal | Purple Gallinule** |
| Anna's Hummingbird | American Oyster-catcher |
| Widgeon | Whimbrel |
| Wood Duck | Dowitcher |
| Turkey Vulture | Black Guillemot** |
| White-tailed Kite | Goldfinch |
| Sharp-shinned Hawk | Belted Kingfisher |
| Cooper's Hawk | Long-billed Marsh Wren |

*The presence of owls in the Marina area is mentioned in an Environmental Impact Report submitted to the City of Berkeley on the Park Marina Shopping Center Development Project in 1971. The ecologic consultant for the EIR was David A. Mullen, Ph.D. Mullen notes that the owls rely on rats, mice and insects in the dump area as a source of food.

*David Smith, Research Director at the International Bird Rescue Center, seriously doubts that the Least Bittern, Whistling Swan, Wilson's Plover and Red Phalarope have been spotted in recent years and guarantees that Purple Gallinule and Black Guillemots have never been seen in Berkeley.

worsens. Species so identified are afforded protection under Title 14, California Administrative Code, Section 607.5 and Fish and Game Code Sections 2040 to 2055. Table 2 tabulates those species known to reside within Basin Two, wherein the study area is located.

A comparison of Table 2 to reports of actual sightings in and near the study area indicate that one "rare" species, the California Clapper Rail is likely to reside in the study area or visit it on occasion. The California Clapper Rail is a hen-sized, long-billed, brown bird with a tawny breast, barred flanks, and a short, upturned tail with white markings underneath. It is usually found close to salt marshes.

It is also speculated that the "endangered" Salt Marsh Harvest Mouse may also reside in the study area. The Salt Marsh Harvest Mouse is native to the brackish and salt-water marshes of San Francisco Bay. It can be identified by its rich brown back and cinnamon to whitish underparts.

(Aquatic Fauna)

Various species of fish are found in the waters of the San Francisco Bay which surround the study site on three sides. These include: bass, perch, flounder, halibut, salmon, jack-smelt, smelt, and anchovies. Perch and flounder are the most numerous; however, no data is known to be available indicating current fish populations or trends over recent years.

A study of the marine benthos in the vicinity of the landfill (commissioned by the Berkeley Department of Public Works) designed to characterize the nearshore benthic community adjacent to the study

TABLE 2

| Common name | Scientific name | FR | BSF&W | Cal. 1 | Cal. 2 |
|--|--|----|-------|--------|--------|
| Mammals | | | | | |
| *Southern sea otter | <u>Enhydra lutris nereis</u> | | T | | |
| Elephant seal | <u>Mirounga angustirostris</u> | | U | | |
| Gray whale | <u>Eschrichtius glaucus</u> | | T | | |
| Humpback whale | <u>Megaptera novaeangliae</u> | | T | | |
| Salt marsh harvest mouse | <u>Reithrodontomys raviventris</u> | E | T | E | F |
| Sei whale | <u>Balaenoptera borealis</u> | | T | | |
| Blue whale | <u>Balaenoptera musculus</u> | | T | | |
| Finback whale | <u>Balaenoptera physalus</u> | | T | | |
| Right whale | <u>Eubalaena glacialis</u> | | T | | |
| Sperm whale | <u>Physeter catodon</u> | | T | | |
| Birds | | | | | |
| California brown pelican | <u>Pelecanus occidentalis</u> | E | T | E | |
| *Southern bald eagle | <u>Haliaeetus leucocephalus</u> | E | T | E | F |
| White tailed kite | <u>Elanus leucurus</u> | | T | | |
| American osprey | <u>Pandion haliaetus carolinensis</u> | | U | | |
| Prairie falcon | <u>Falco mexicanus</u> | | | | |
| American peregrine falcon | <u>Falco peregrinus anatum</u> | E | T | E | F |
| *Greater sandhill crane | <u>Grus canadensis tabida</u> | | | | F |
| California clapper rail | <u>Rallus longirostris obsoletus</u> | E | T | E | F |
| California black rail | <u>Laterallus jamaicensis coturniculus</u> | | T | R | F |
| Western snowy plover | <u>Charidrius alexandrinus nivosus</u> | | U | | |
| Alaskan short billed dowitcher | <u>Limnodromus griseus caurinus</u> | | U | | |
| Yakutat fox sparrow | <u>Passerella iliaca annectens</u> | | U | | |
| California least tern | <u>Sterna albifrons browni</u> | E | T | E | F |
| California yellow-billed cuckoo | <u>Coccyzus americanus occidentalis</u> | E | T | E | F |
| Samuel's song sparrow | <u>Melospiza melodia samuelis</u> | | U | | |
| Suisun song sparrow | <u>Melospiza melodia maxillaris</u> | | U | | |
| San Francisco song sparrow | <u>Melospiza melodia pusilla</u> | | U | | |
| In addition, all shorebirds are protected. | | | | | |
| Reptiles | | | | | |
| Alameda striped racer | <u>Masticophis lateralis euryxanthus</u> | | | R | |
| San Francisco garter snake | <u>Thamnophis sirtalis tetrataenia</u> | E | T | E | F |
| Giant garter snake | <u>Thamnophis couchi gigas</u> | | U | R | |
| Fishes | | | | | |
| Thicktail chub | <u>Gila crassicauda</u> | | U | E | F |
| Sacramento perch | <u>Archoplites interruptus</u> | | U | | |
| Tidewater goby | <u>Eucyclogobius newberryi</u> | | U | | |

FR - Federal Register, Vol. 35, Number 199, October 13, 1970.

BSF&W - Bureau of Sport Fisheries and Wildlife. Threatened Wildlife of the United States. 1973.

Cal. 1 - California Department of Fish and Game. At the Crossroads: A Report on California's Endangered and Rare Fish and Wildlife. 1974.

Cal. 2 - California Department of Fish and Game. California's Fully Protected Birds, Mammals, Reptiles, Amphibians and Fish. January, 1971.

T - Threatened

E - Endangered

R - Rare

F - Fully protected

U - Status uncertain

* - Occurrence of this species or subspecies is uncertain or questionable.

SOURCE: STATE WATER RESOURCES CONTROL BOARD, WATER QUALITY CONTROL

PLAN REPORT, SAN FRANCISCO BAY BASIN (2), APRIL 1975



site, was completed in June, 1976. [An Investigation of the Marine Benthos Around the Berkeley Landfill; Engineering Science Inc., June, 1976] Benthic samples collected during this survey were dominated by several species of polychaete worms, gammarid sand fleas, and the bent-nosed macoma clam. No nemotodes or oligochaetes were found in any of the samples. The species diversity was found to be generally low indicating that the benthic community was under some stress due to poor or changing environmental conditions (see also discussion under Water Quality this Chapter).

Soft-shell, bent-nosed, and littleneck clams occur in the intertidal zone of San Francisco Bay in sufficient numbers to be considered potentially harvestable. Eastern and pacific oysters were once harvested commercially in the bay and are also still abundant. Ribbed horse-mussels are abundant in the lower bay and bay mussels are common throughout. Many of these shellfish species are commonly gathered by individuals, for non-commercial uses, in the shoreline areas surrounding and adjacent to the study site.

WATER QUALITY

The waters of San Francisco Bay to the north and east of the study area (at the points where the Gilman Street and Virginia Street outfalls discharge) have for years been placed under stress by the reception of untreated municipal wastes and storm run-offs. Although this condition has been recently improved (i.e. industrial and domestic wastes are now collected and transported to an East Bay Municipal District treatment facility), untreated storm run-offs continue to enter the Bay at these points.

The quality of the Bay waters surrounding the landfill disposal

site was also analyzed by the previously mentioned Engineering Science Inc. report. Particular emphasis was placed on those areas adjacent to the study area suspected of seeping leachate from the garbage fill to the Bay. Three basic water quality parameters were examined which were: pH, dissolved oxygen, and salinity. In all cases, pH was effectively neutral and dissolved oxygen levels were close to saturation. Table 3 tabulates various sample points used for this study. Figure 9 locates these sample points.

(Groundwater)

Groundwater on the site is restricted to pockets of highly polluted liquid entrapped within the garbage fill.

CIRCULATION

Currently, the study area is accessible by only one route which is known locally as Dump Road. This road extends along the northern perimeter of the lands of Murphy and Santa Fe, from the intersection of Virginia Street and the Interstate I-80 Frontage Road, to a point north of the dump office as-a paved road. Beyond the dump office, the road continues as a paved road to the northwesterly tip of the disposal site thence along the top of the dike where it terminates. To the south of the study area is Spinniker Way which extends west from Dump Road to Breakwater Drive. Marina Boulevard, which extends in a general north-south direction from the intersection of Dump Road and Spinniker Way to University AVenue, is the primary access road to the entire Berkeley Marina area. University Avenue, one of Berkeley's major arterial thoroughfares, intersects Marina boulevard. Figure 10 is a map displaying the circulation characteristics

ANALYSIS OF SEEPAGE FROM BERKELEY LANDFILL

| Constituent | Concentration, mg/l | |
|----------------------|---------------------|-----------|
| | Station 6 | Station 8 |
| Arsenic | < 0.03 | < 0.03 |
| Cadmium | 0.038 | < 0.004 |
| Chromium | 0.048 | < 0.02 |
| Copper | 0.037 | 0.033 |
| Lead | 0.33 | 0.20 |
| Mercury | 0.052 | 0.038 |
| Nickel | 0.11 | 0.061 |
| Zinc | 0.027 | 0.069 |
| Ammonium Nitrogen | 0.60 | 84 |
| Grease and Oils | none observed | 0.6 |
| pH, pH units | 7.7 | 7.6 |
| Pesticides | | |
| p,p'DDT | < 0.001 | < 0.001 |
| λ BHC | < 0.001 | < 0.001 |
| $\alpha + \beta$ BHC | < 0.001 | < 0.001 |
| Lindane | < 0.001 | < 0.001 |
| Heptachlor | < 0.001 | < 0.001 |
| Endrin | < 0.001 | < 0.001 |
| Aldrin | 0.007 | 0.002 |
| Dieldrin | < 0.001 | < 0.001 |
| p,p'DDE | 0.004 | 0.002 |
| α, p' TDE | < 0.001 | < 0.001 |
| p, p' TDE | < 0.001 | < 0.001 |

TABLE 3

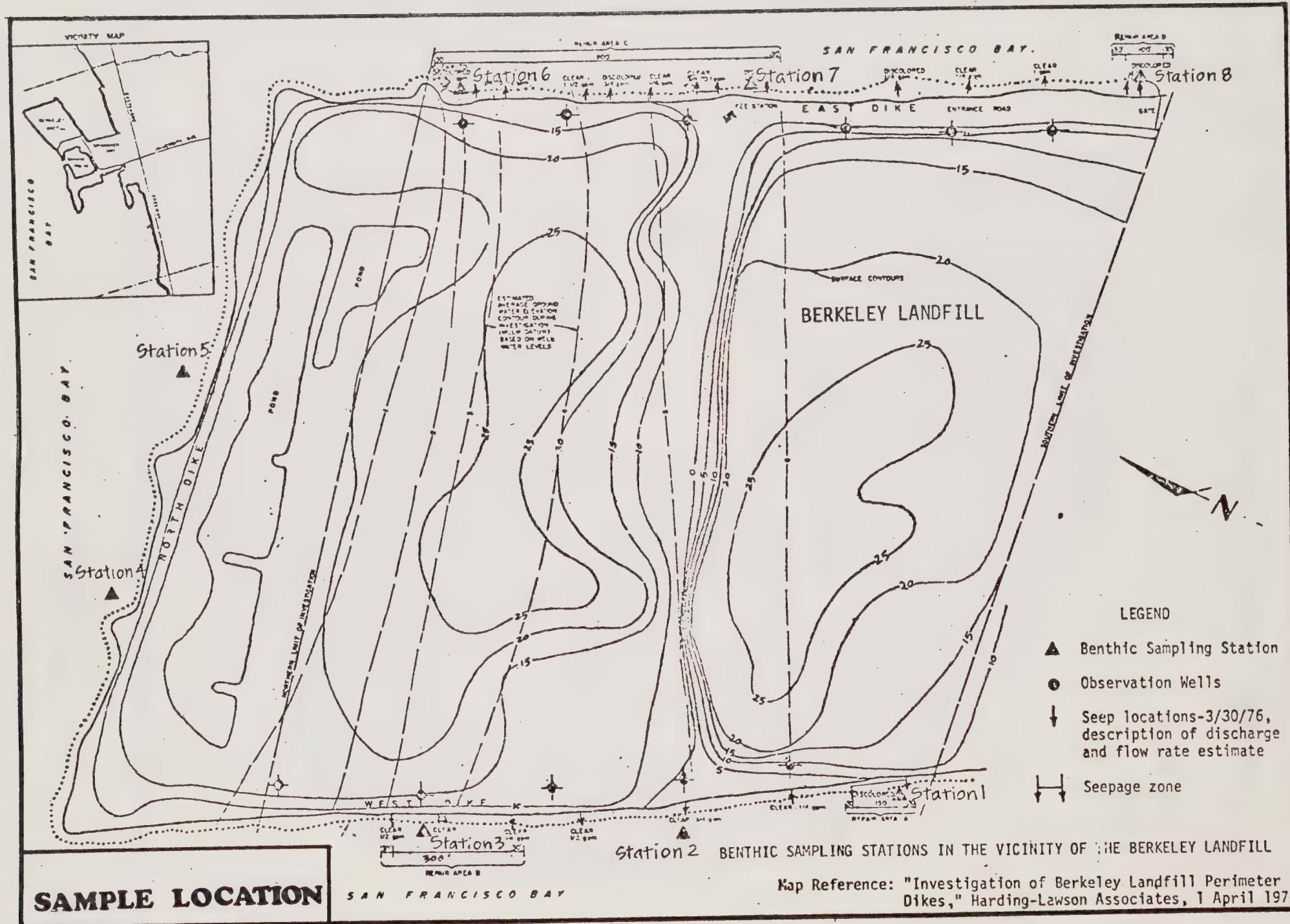
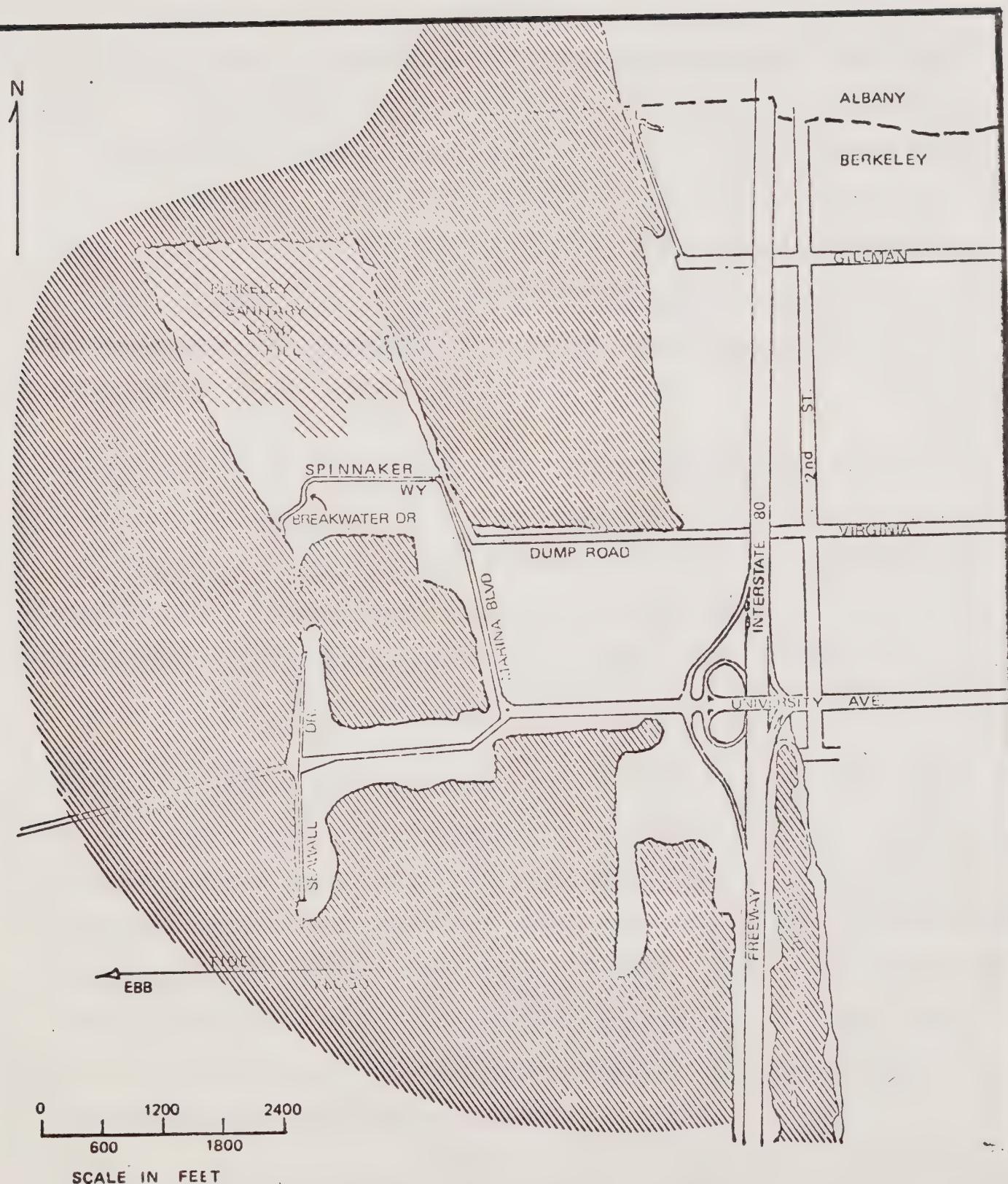


FIGURE 9

FIGURE 10



MARINA AREA CIRCULATION

SPECTRUM NORTHWEST
SCHNELKER 5-28-76

of the study area.

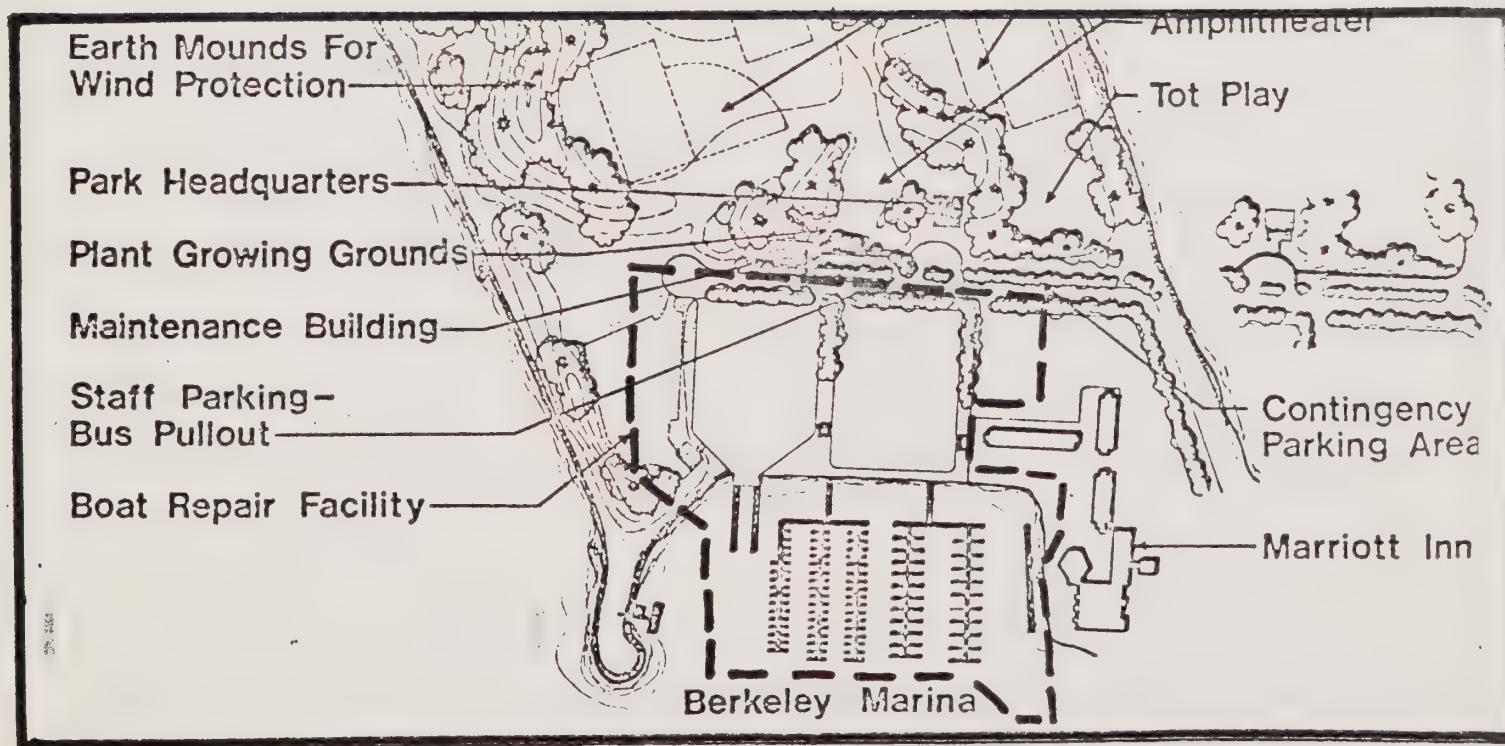
Vehicular flows to the Marina area currently average 5,000 trips daily. The destination of between 800 and 1,200 of these trips is the Sanitary Landfill Disposal Site located on the study area. [Traffic Analysis of the Berkeley Marina Area; Spectrum Northwest, 1977] Other traffic generators, affecting the area's circulation system, include: the three eating/drinking establishments discussed in the section on Adjacent Land Use, the boat docking facilities of the Marina, and nearby Golden Gate Fields.

Pedestrian access to the study area is presently limited and hazardous as is bicycle access. The roads comprising the study area's circulation network have been designed for vehicular traffic and are devoid of sidewalks or designated bicycle lanes. Additionally, these roads are seldom patrolled by traffic enforcement personnel and, as a consequence, vehicular flow is often high-speed.

With the exception of Dump Road, most of the local access routes to the study area are in serviceable condition; however, as most of these lands are the result of previous landfill operations, settlements are taking place which are often differential in character resulting in swales or waves in the roadbed. This fact raises the probability that future maintenance requirements for these roads will be higher than those for roads, subject to similar loadings, constructed over more stable bases.

Limited public mass-transit service is provided by A/C Transit to selected points in the Marina. However, these facilities are not heavily used nor widely advertised. Figure 10 also displays the

FIGURE 12
DOCK FEATURES



bus routes currently serving the Marina area.

ADJACENT LAND USE

Land use south of the study area is primarily devoted to boating, fishing, open space, and a few commercial facilities. The existing developments include: two cocktail/restaurant establishments ('His Lordships' and Solomon Grundys'), a sports center (which handles bookings for sport fishing boats and operates a bait and tackle shop and snack bar), the Angel Island Ferry landing, the Marriott Inn (which also includes a restaurant and cocktail lounge), a fuel dock (leased to ARCO) and the municipally owned boat launching ramp, fuel dock, and marina administrative offices.

RELATED PROJECTS

The City of Berkeley has undertaken a construction program designed to improve the integrity of the peripheral dikes surrounding the study area. This project consists of: sealing the perimeter dike, placement of armour rock along the dikes' bayward exposures, development of view areas and fishing platforms, and construction of a maintenance access road. Figure 11 presents pertinent features of this project.

The area west of the launching ramp to the water's edge and south of Spinnaker Way is planned for development of a privately operated public boat repair facility. Figure 12 is a preliminary layout of this proposed project.

The development would remove the existing sports center (which is currently operating from a large portable trailer) and replace it with two separate structures which would house: a new sports center

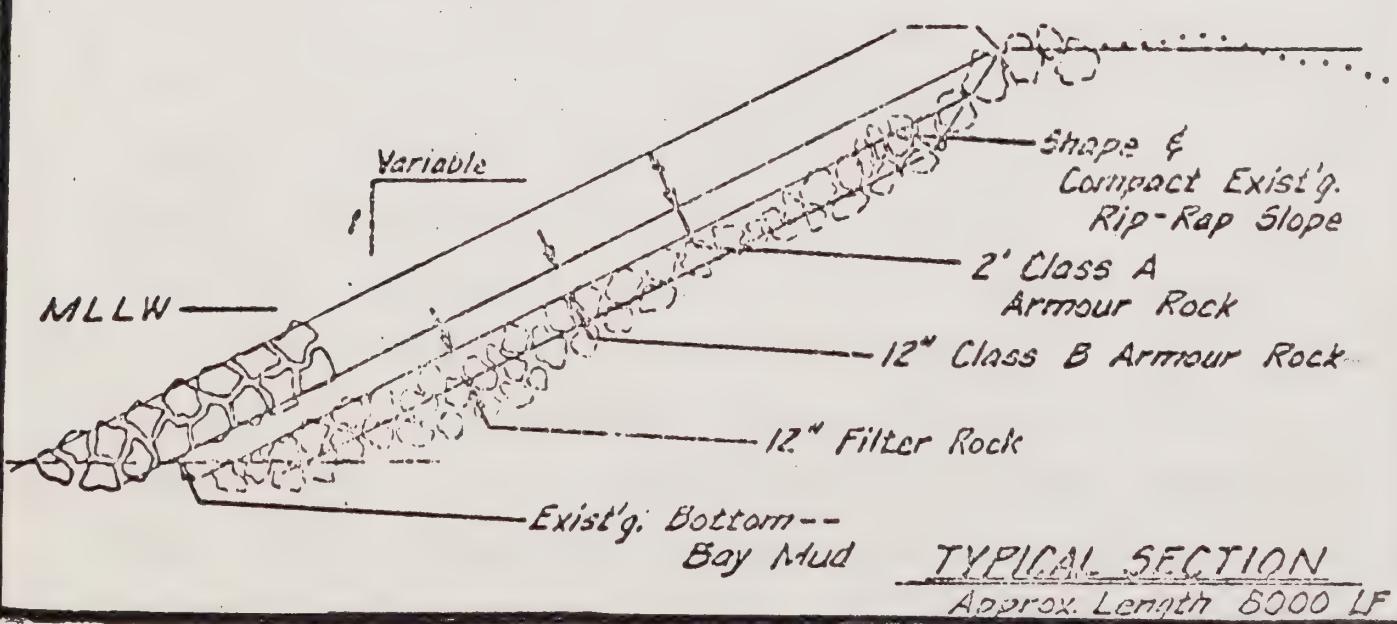
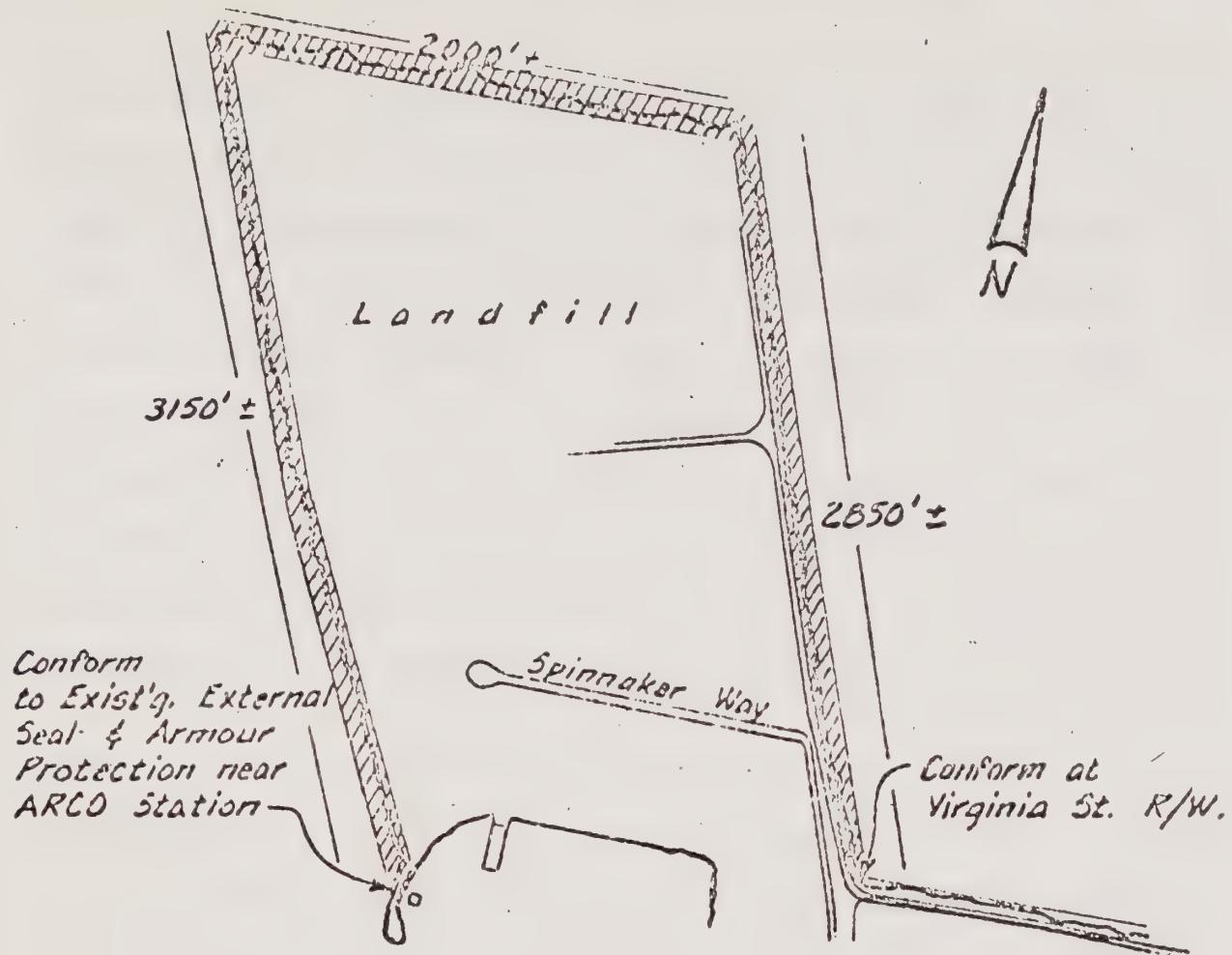


FIGURE 11
DIKE IMPROVEMENT PROJECT

that the City's population base will remain numerically constant, changes in its composition are expected to occur. It is speculated that the white segment of the population base will decrease approximately 3,000 (or 2.5% of the 1970 base) during the period 1970-1980. The black population segment of the Berkeley community is expected to equal one-third of the total population by 1980 (assuming present trends continue). Increases in the Spanish-surname segment of the population base are also anticipated as are increases in the Chinese, Filipino, and assorted Asian group members with the exception of the Japanese who appear to be leaving Berkeley.

That segment of the Berkeley population base attributable to students of the University of California is expected to remain static throughout the decade 1970-1980. However, recent changes in the University's admission policies and continued declines in High School achievement scores on various admission tests may have an effect on this projection. Recent effects of these factors can be detected in the most recent data published in the California Statistical Abstract [State of California, Department of Finance, 1976] and information recently released by the University's Office of Institutional Research. These data indicate that during the period January 1, 1975 -- January 1, 1976 the population of Berkeley declined by approximately 600 persons while the population of the University's student body declined by approximately 973 persons. When corrections are made for the estimated percentage of UCB students residing outside of Berkeley (approximately 26.0%) it becomes apparent that the student body decline is the greatest factor in white population decline in the City of Berkeley.



(Distribution)

The major Asian groups residing within the City of Berkeley can be found in scattered geographical locations. The Japanese are generally concentrated in the North Hills and Sather Gate areas, while the Chinese reside almost exclusively in the Sather Gate area. Filipinos reside in both the North Hills and Sather Gate areas.

Berkeley's Black population is the most confined of the City's major minority groups. Approximately 95.0% of this segment of the Berkeley population base resides in the Flatlands area while two-thirds of the base resides in the south and west portions of the Flatlands area.

The Spanish population component is also rather concentrated. For the most part, these members of the community reside in the area bounded by Grove Street, Dwight Way, and the Albany border. The greatest Spanish surname concentration seems to be the West Berkeley area (west of San Pablo, between Cedar Street, Sacramento Avenue and the Albany border).

Berkeley's white population component is the least confined of all the City's racial and ethnic population components and lives, primarily, in the areas of least density. Less than one-quarter of this group live west of Grove Street, while only a few reside in south and west Berkeley.

(Automobile Ownership)

A 1973 inventory of automobile ownership in Berkeley indicates that approximately 60,000 vehicles are registered to owners with addresses

in Berkeley. [Telephone Conversation; H. Sinemus, Berkeley Transportation Department, March 20, 1978] Distribution of vehicular ownership is generally heaviest in areas of greatest density, however, automobile ownership in the Berkeley Hills area (the City's most affluent and least dense area) is almost equal to the registration for the remaining sections of the City.

CHAPTER IV

IMPACTS

The environmental impacts associated with the proposed project are two-fold: 1) Impacts related to construction of the proposed project facilities, and 2) Impacts related to operation of the proposed project.

CONSTRUCTION IMPACTS

The construction of the proposed project involve the following general categories of actions:

- Landform modifications
- Installation of sub-surface facilities
- Construction of surface facilities
- Construction of shoreline facilities*

[*Note: The construction activities associated with sealing of the peripheral dikes are not included in this analysis. Although the Berkeley North Waterfront Park Draft Land Use Plan does discuss the dike sealing project as one of the required actions for development of the Park, this project has previously been subjected to the environmental analysis process as part of the City's pursuit of a Federal Public Works Bill grant. For a detailed analysis of the environmental impacts associated with the dike sealing project, the reader is referred to North Waterfront Park Dike Improvement Project (State Clearinghouse Number 76092039. However, certain shoreline improvements (i.e. maintenance road construction, construction of underground utility facilities, and construction of fishing platforms) have been eliminated from the Dike Improvement Project as funded. Therefore, the environmental impacts associated with these activities will be discussed within this section.]

Impacts Associated with Landform Modification

Perhaps the most profound impacts to the physical environment, associated with the construction of the proposed project, would stem

from this activity which would require:

- Continuation of the existing sanitary landfill operation
- Massive importing of topsoil materials
- Placement, compaction, and sculpturing of fill and soil cover materials

(Continuation of sanitary landfill operations)

The sanitary landfill operation at the study site is expected to continue for at least five (5) more years and could continue for a longer period depending upon the site elevations decided upon in the final grading plan, and the effects of various solid waste reduction measures now in operation in Berkeley.

The bulk of this activity is expected to occur in the northern areas of the site in what is planned for the Natural Zone of the proposed project.

Currently, between 345 and 390 tons of unclassified municipal solid waste is landfilled on the study site daily. This material is transported to the site by a fleet of privately-owned commercial and City refuse collection vehicles making approximately 345 trips daily. [Draft City of Berkeley Solid Waste Management Center Preliminary Design; Garretson, et. al. August, 1977]

Once there, the solid waste material is distributed by bulldozer and compacted to a density of approximately 2,000 lbs. per cubic yard. Finally, a thin (approximately 3 inch) layer of topsoil is spread over the garbage material. Each of these operations is currently accomplished by equipment powered by diesel engines which, to some degree, adversely affect local and regional air quality

through the emission of various organic and inorganic pollutants. Additionally, these operations elevate nearby ambient noise levels.

These impacts are not likely to reach significant levels as the potential effects on regional air quality are so slight that, more than likely, they will escape detection. The effects of this activity on local ambient noise levels are expected to be confined to the active construction zone.

Some effects on the circulation system of the Region are associated with the continuation of fill activities at the study site. However, these effects are minor and represent no change from the existing status-quo.

(Import of topsoil materials)

Two factors govern the amount and type of topsoil materials required to prepare the site for use as a park. They are:

- soil suitability to support (and nourish) selected plant materials
- soil suitability to effectively seal the garbage fill against surface water percolation

While the first requirement is relatively clear, the second bears some supplementary explanation. The Regional Water Quality Control Board (San Francisco Bay Region) is empowered to establish sanitary landfill closure requirements when a potential exists for a landfill to adversely effect the water resources of the State. The preliminary closure requirements for the Berkeley Landfill (study site) call for a soil cover not less than three (3) inches thick and reflecting permeability characteristics not less than 10^{-6} cm/sec.

Although it is not clear if some areas of the site (which have already received cover) meet this requirement, if it were necessary to cover the entire site, approximately 421,080 cubic yards of material would be required. Large soil transport vehicles can accomodate approximately 20 cubic yards of soil per load, and there are no known sources of suitable material in close proximity to the study site. Therefore, 21,054 vehicle trips, within an unknown time-frame and of undetermined length, may be required to meet the minimum final cover requirements of the Regional Board.

Obviously the transport of these materials (by gasoline or diesel fueled trucks) would have adverse effects upon: local and regional air quality, ambient noise levels adjacent to the transport route, the regional circulation system, and upon scarce fossil-fuel sources. These effects can be considered significant.

(Spreading, compaction, and sculpturing)

The spreading, compaction, and sculpturing of topsoil materials would also most likely be accomplished by gasoline or diesel powered equipment which would likewise contribute incrementally to regional air quality degradation, through emission of pollutants and dust liberation. Additionally, elevated ambient noise levels, in the vicinity of the landform modification activity, could be expected; however, this effect is not expected to be significant due to the site's remoteness from centers of human activity.

Impacts Associated with the Installation of Sub-Surface Facilities

This activity would include installation of: water (to include irrigation and potable supply systems), drainage, and power systems,

and possibly methane detection/monitoring facilities. At present, the requirement for all these facilities is not clear; however, for purposes of environmental analysis, it will be assumed that such facilities will be required.

The installation of sub-surface facilities is not likely to generate significant environmental impacts. Minor contributions to regional air quality degradation, elevated local ambient noise levels, and regional circulation system congestion (as the result of materials transport) could occur however, these impacts are expected to be of such minor significance that detection is not likely outside of the study area.

Impacts Associated with Construction of Surface Facilities

Within this category of activity are included the construction of: a peripheral maintenance road, pedestrian/jogging paths, bicycle trails, the pond, and the Park Headquarters/Maintenance Building.

The impacts associated with this activity also stem from: the transport of construction materials, grading and compaction of road/path surfaces, and building erection. These impacts are expected to be minor contributors to: regional air quality degradation elevated local ambient noise levels, and regional circulation system congestion. Again, these impacts are expected to be of such minor significance that detection of them is not likely outside of the study area.

Impacts Associated with Construction of Shoreline Facilities

This activity would involve the construction of several shoreline fishing areas situated around the periphery of the study site and

includes the placement of armour rock materials on the peripheral dikes and the bay mud (in the near-shore inter-tidal zone) in a manner to provide accessibility for sport fishing purposes. Much of the work involved is expected to be accomplished by manual labor. Figure 13 is an artist's conception of a representative fishing platform.

The environmental impacts associated with this activity include disturbance of the immediate inter-tidal benthic community and some minor contribution to regional air pollution and circulation system congestion as the result of materials transport. Although the impacts to the local inter-tidal benthic community may result in its destruction, it is anticipated a new community will develop in relatively short order. However, human access to these inter-tidal areas, for purposes of shellfish gathering is likely to be permanently reduced.

OTHER IMPACTS OF CONSTRUCTION

The wildlife regime of the study area is currently dominated by rodents (principally rats), scavengers, and predators. The conversion of the study site to a public park would result in actions likely to modify this regime. The construction actions, associated with the site's conversion, would result in sealing the edible garbage materials from easy access by rodents and scavengers. Additionally, positive human intervention actions, designed to prevent the migration of rodents to inhabited areas of the City, would be undertaken. As a result, the savenger component of the existing regime (which are for the most part highly mobile fowl) would relocate

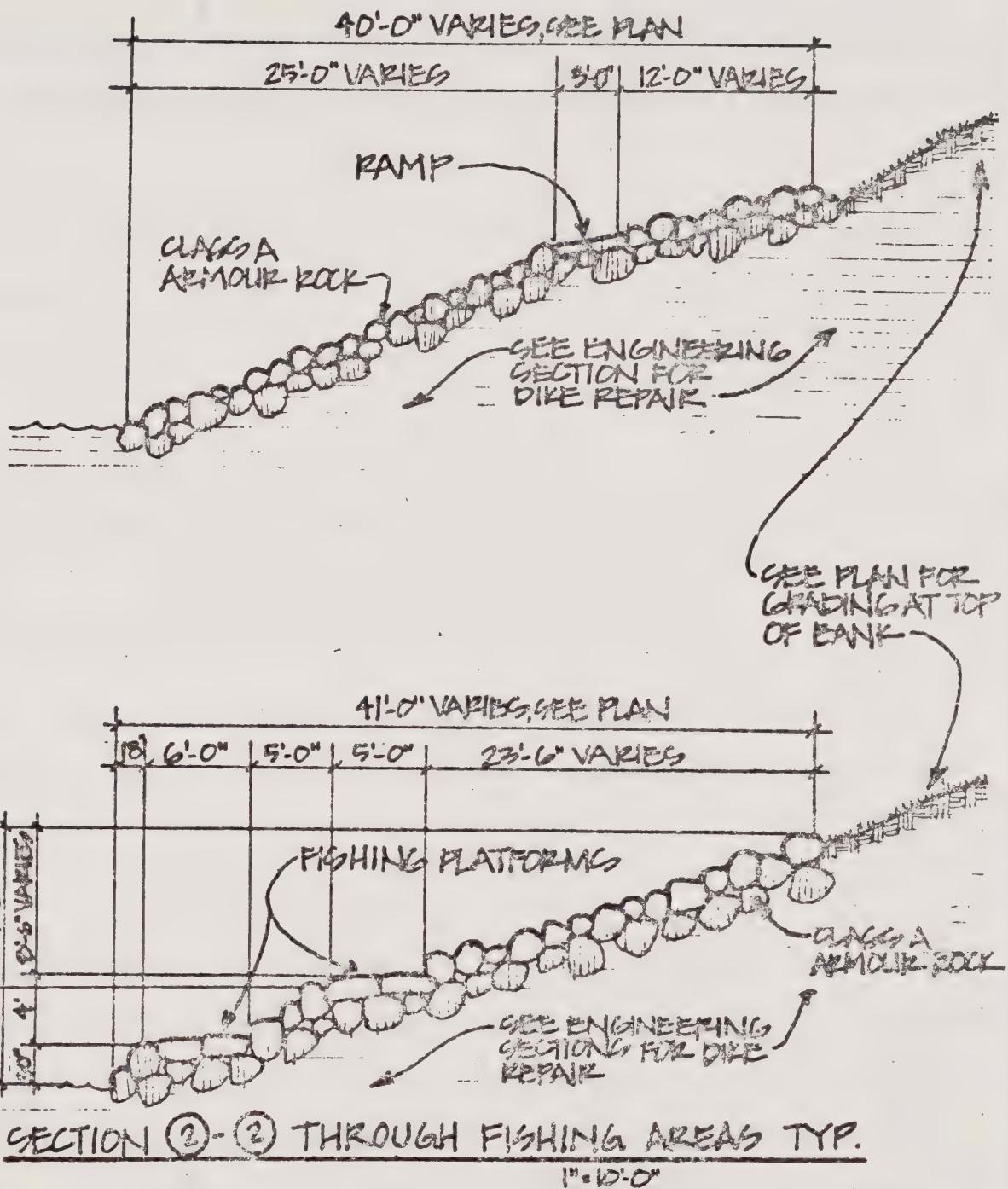


FIGURE 13

FISHING PLATFORM

to areas affording easier access to food, and reduction of the rodent population would probably induce a similar action on the part of predators.

These impacts are expected to be long-term and are not likely to be reversed.

OPERATIONAL IMPACTS

Circulation System

Perhaps the most severe impact on the physical environment, likely to result from operation of the proposed project, would be to the existing surface access system.

The Park, when fully developed, is expected to be a significant generator of traffic which will exhibit sharply differing characteristics of flow and length of stay than that currently frequenting the site.

For planning purposes, the site is expected to attract up to 1,000 persons on peak useage days (warm, sunny, weekend days). If arrival patterns, observed at East Bay Regional Park District facilities are duplicated at the proposed project, the majority of these visitors will arrive by privately-owned automobiles and result in approximately 285 vehicular trips.

The peak Park useage period would also coincide with the peak useage period for existing Marina facilities and, it is expected greatly increase competition for close-in parking spaces. These facilities are already strained in some areas of the Marina, particularly those in close proximity to the proposed project's entrance.

The existing road system, serving the study area, is considered adequate for vehicular access and is not likely to require expansion or improvement. Minor congestion could occur near the Park's entrance and in the vicinity of nearby parking areas.

The mass transit, pedestrian, and bicycle access features of the study site's immediate vicinity are also inadequate and future improvement of these features is thought to be necessary.

Water

Establishment of the several plant communities associated with the proposed project would require water in quantities beyond those likely to be provided by natural rainfall. Moreover, the initial filling of the seven acre pond, proposed for the Natural Zone of the proposed project, would require 6.8 to 11.4 million gallons of water and approximately 150,000 gallons per day (gpd) would be required to keep it full. [J. Madsen; Inter-Office Memo, 9/27/77]

Accurate estimates of the irrigation requirement of the proposed project cannot be made until such time as determinations of the plant materials to be used are made; however, for planning purposes, it is estimated that approximately 300,000 gpd would be required.

[Ibid.]

Energy

The proposed project would consume electrical energy that would be obtained from Pacific Gas and Electric Co. No estimates of the project's energy needs are available at this time.

Disturbance of Wildlife

The Natural Zone of the proposed project is intended to attract several wildlife species that are incompatible with high levels of human activity. Notwithstanding, it is desireable that opportunities to observe these species, in natural settings, be afforded park visitors. Should these opportunities be made too plentiful, and result in high levels of human activity, these species are likely to abandon the site.

Annual Costs

In addition to the costs associated with the purchase of energy and water for the proposed project, various maintenance, supervisory, and patrol personnel would be required. Staffing requirements are not fully developed at this time; however, it is anticipated that at least one maintenance crew (supervisor and five gardeners), a Park Superintendent, and a staff of Park Rangers would be required. The annual costs associated with these personnel exceeds \$100,000.

CHAPTER V

MITIGATION MEASURES

CONSTRUCTION IMPACTS

Air Quality

The impacts on local ambient air quality associated with construction of the proposed project could be reduced by consolidating loose soil materials, at the earliest practical time with water or chemical holding agents thereby preventing any unnecessary blowing of soil particles due to wind action. Additionally, the contractor should be required to shut down all construction machinery not in actual use. This action would minimize the emission of air pollutants associated with the operation of gasoline or diesel powered construction machinery and would have the additional beneficial effect of reducing the consumption of scarce fossil fuels.

Circulation System

Impacts to the local and regional circulation system likely to occur during construction of the proposed project could be reduced by scheduling the delivery of construction materials to coincide with hours of low system use (off-peak hours). This action would also have beneficial effects on regional air quality, by minimizing pollutant emissions caused by traffic congestion, and on fossil fuel consumption by minimizing wasteful idling of materials transport vehicles in traffic jams.

Dislocation of Rodents

Construction of the proposed project would dislocate the study

sites existing rodent populataion. The natural tendency of these populations would be to relocate to nearby areas of plentiful food. Inasmuch as these populations are highly compatible with humans, it is likely that they would attempt to relocate to nearby human population centers.

Rodents are considered pests and are known bearers of disease; therefore, positive human intervention measures would have to be undertaken to prevent their relocation. However, care in the design of any eradication program must be exercised in order to minimize secondary effects on the predator populations currently feeding upon the rodents as some of the predators, although not currently considered rare or endangered, are in low numbers throughout the San Francisco Bay Area and should be protected.

OPERATIONAL IMPACTS

Access and Parking

Several mitigation measures could be undertaken to reduce the impact on the local access and parking facilities likely to be generated by the proposed project. These include:

- Improvement of the bicycle pedestrian, and mass transit systems servicing the proposed facility.
- Provision of satellite parking areas connected to the proposed project by shuttle bus
- Provision of satellite parking areas within walking distance of the proposed project
- Adoption of a parking control plan to insure that users of existing Marina facilities are afforded reasonable opportunities to park.

Each of these proposed mitigation measures are likely to be under-

taken as future needs dictate.

Water

The irrigation water needs of the proposed project could be minimized by selection of plant materials having low moisture requirements. The purchase of water to meet irrigation needs could be reduced (or perhaps eliminated) by tapping Virginia Creek in the vicinity of the Virginia Street outfall. This source could also be used to supply the pond proposed for the Natural Zone. Further studies are required to determine the feasibility of this mitigation measure.

The site's drainage system could also be designed to convey the bulk of surface run-off to the pond; thereby, reducing water requirements to make up evaporation losses. Care would have to be taken in designing such a system; however, to insure that surface run-offs do not come in contact with garbage fill materials.

Energy

Some reduction in operational energy demand associated with the proposed project could be achieved by use of solar heating for the headquarters building and use of wind generators or windmills to pump water for irrigation and the pond.

Disturbance of Wildlife

Several of the wildlife species, likely to be attracted to the Natural Zone of the proposed project, are not compatible with high levels of human activity. The preliminary design of the proposed project takes this consideration into account by:

- limiting human access

- recommending plant materials that provide food and shelter
- employment of buffering devices around the pond area designed to break line of sight between humans and animals.

At a minimum, these provisions should be included in the final design of the project.

CHAPTER VI

ALTERNATIVES TO THE PROPOSED PROJECT

SELECTION PROCESS

In order to discuss the realistic alternatives to the proposed project, it is necessary to understand the historic background of the study site and the several actions and commitments already undertaken that limit the range of options available to decision-makers at this date. A detailed analysis of these actions (and commitments) is presented within the document An Investigation of the Environmental, Economic, and Social Aspects of the Berkeley Refuse Landfill [Spectrum Northwest; June 1976]. A summary of this analysis is presented in the following.

In 1913, the City of Berkeley, by grant of the State Legislature, acquired title to the tidelands along the City's western shore, and commenced a series of dike and fill operations to dispose of its municipal waste. The current landfill operation, which is the study site, was commenced prior to 1964 and the north dike was closed in 1968.

The public attitude regarding bay-fill projects began to grow hostile during the early 1960's and resulted in the passage of the McAteer-Petris Act which created the San Francisco Bay Conservation and Development Commission (BCDC), in 1965. However, the Berkeley Landfill operation was grandfathered in and, as such, was beyond BCDC jurisdiction.



Many environmentally active groups such as: Save the Bay Association, the Audubon Society, and the Sierra Club, concerned about vanishing bay surfaces and tidelands, resulting from fill operations, strongly supported the creation of BCDC. These groups also expressed great concern over the future use of lands created by dike and fill operations and have been vigorously opposed to the use of these areas for commercial, industrial, and residential uses. They have also expressed opposition to the use of such lands for narrow recreational uses, such as golfing or yachting, preferring instead that maximum public access and enjoyment be part of any development on reclaimed lands.

In response to the concerns of Berkeley citizens, and several environmental action groups, the Berkeley City Council (by Resolution 45,688 N.S.) created the Waterfront Advisory Board for the purpose of recommending to the Council policies for the development and use of Berkeley's waterfront facilities in 1973.

In 1972, the United States Army Corps of Engineers claimed jurisdiction over portions of the landfill disposal site and informed the City that continuation of landfill operations at the site would require a Corps permit. In 1973, the City submitted an application for a permit to the Corps which was initially opposed by some environmental action groups and, following a series of exchanges between the City and the Corps, the Corps secured a preliminary Federal injunction prohibiting landfill operations on the northern 18 acres of the study site.

During the period 1973 - 1975, the Waterfront Advisory Board (in

cooperation with: conservation groups, citizen activists, and the City's Planning Commission) developed a recommendation for the unstructured recreational use (to the greatest extent possible) of the lands north of Spinnaker Way (the study site). This recommendation was one of several amendments to the City's Master Plan that was under consideration by the City Council when the Corps obtained the preliminary Federal injunction. Notwithstanding, several of the environmental action groups were reluctant to withdraw their objection to issuance of a Corps permit until more concrete action by the Council (i.e. adoption of the General Plan Amendments) committed the City to development of an unstructured recreational facility on the study site.

Further complicating the situation, the City (in January, 1976) received an order (resolution 76-9) from the San Francisco Regional Water Quality Control Board (RWQCB) to cease the practice of discharging waters impounded south of the northerly dike (in an area of approximately seven acres) to the waters of San Francisco Bay, and to prevent contact of Bay waters with the waste material portions of the fill. These requirements necessitated certain repairs to the northern dike and construction of an interim pumping facility to divert the impounded waters to a sewer of the East Bay Municipal Utility District (EBMUD) until repairs to the dike could be affected. Inasmuch as these activities would have to take place in an area within the Corps jurisdictional claim, they too would require prior Corps approval.

In response to the objections of conservation groups and the requirements of the RWQCB, the Director of Public Works designed an Action

Plan, which was presented to representatives of all groups known to be interested in or affected by completion of fill activities at the study site. The Action Plan, which was the predecessor to the North Waterfront Land Use Plan (the proposed project) was subsequently revised (with minor modifications) and submitted to the Berkeley City Council for adoption on May 11, 1976 (Resolution 47, 935 N.S.) and as a result, the permit, to complete fill operations, was issued by the Corps of Engineers on March 15, 1977.

As can be readily deduced, the range of alternatives open to decision-makers at this juncture have been severely constrained and alternative land uses such as housing, industrial, or structured recreational uses have been rejected, largely on environmental grounds, in favor of the proposed project.

Resolution 47,935 N.S. of the Berkeley City Council states that the publicly-owned land north of Spinnaker Way (the study site) shall be used for unstructured public recreational uses.

The term "unstructured recreation" is somewhat nebulous and has been interpreted by citizen and professional formulators of the North Waterfront Land Use Plan to mean an environment wherein maximum opportunities for self-expression in recreational pursuits can occur together with improvisational group activities. Assuming that the proposed project will be an unstructured recreational facility, two alternatives to the proposed project are available:

- More intense recreational development
- Less intense recreational development

(More Intense Recreational Development)

The proposed project could have provided for higher levels of im-

provisional recreational use by expansion of the proposed Recreation Zone and reduction (or elimination) of the Transitional Zone. This alternative was discarded because it was known that spill-overs from the Recreation Zone would likely occur causing disturbance to the wildlife inhabitants of the Natural Zone. Such an occurrence would reduce the park's attractiveness to some persons and, because more intense recreational uses would most likely be designed around increased group activity, such a use would reduce opportunities for individual self-expression.

(Less Intensive Recreational Use)

This alternative would reduce opportunities for group recreational activities and, it is felt, exclude a substantial portion of the Berkeley population who are not particularly interested in individual recreational, self-expression, or wildlife appreciation activities. For this reason, it was rejected.

(No-Project or Null Alternative)

The No-Project or Null Alternative would be inconsistent with commitments made by the City to the Corps of Engineers and would, therefore, require revision of the permit to complete fill operations at the site. The consequences of such an occurrence are explained in detail in the document An Investigation of the Environmental, Economic, and Social Aspects of the Berkeley Refuse Landfill [Spectrum Northwest; June, 1976].



CHAPTER VII

STATUTORY REQUIREMENTS

Potential Environmental Effects Found to Have No Significance

During construction phases of the proposed project, local ambient noise levels would be elevated as one result of construction machinery operation. This effect is deemed to be of minor significance in that it will occur in an isolated, uninhabited area and will probably not be detectable beyond the boundaries of the study area.

Additionally, when the proposed project becomes operational, the transport of park visitors by automobile would have some effects upon regional air quality. However, the trip generation factor of the completed facility is significantly lower than the present operation (approximately 1,500 per week compared to 3,000) and inasmuch as the impacts of regional air quality (attributable to the study site) represent a reduction of the current effects, they are deemed to be of no significance.

Implementation of the proposed project would also modify the existing wildlife regime of the study area. This regime, as explained elsewhere, is rodent dominated and dependent upon relatively easy access to food. Inasmuch as rodents are considered pests, and are known bearers of disease, this effect is considered significant but beneficial.

Significant Unavoidable Environmental Effects

The transport of soil cover and construction materials, excavation/landform transformation activites, and the operation of construction machinery would have impacts on regional air quality that can not be totally eliminated if the proposed project is undertaken.

Significant Irreversible Environmental Changes

Construction of the proposed project would require the expenditure of human and mechanical energy, the majority of which would derive from irreplaceable fossil-fuel sources, and be unrecoverable. Additionally, some raw materials and building materials would be dedicated, during the construction of the proposed project, which would be impractical to recover and, therefore, lost forever for alternative uses.

Local Short-Term vs. Long-Term Productivity

The proposed project represents a dedication of the study site to a long-term enhancement of the local and regional environment. The site has no practical long-term productivity potential in its present state.

Growth-Inducing Impact of the Proposed Project

The proposed project has no growth-inducing potential.

Persons and Organizations Consulted

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U.C. BERKELEY LIBRARIES



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